Section

2

Supplier Quality Assurance Manual

Policy

This Supplier Handbook is intended to communicate Hitachi Astemo Americas, Inc.'s and Hitachi Astemo Americas, Inc. – Harrodsburg Site's requirements to all production material suppliers. Hitachi Astemo Americas, Inc. may be designated as (Astemo)AM and the Harrodsburg site may be designated as USAM-USHRP1 throughout this manual. To clarify requirements necessary for the suppliers to implement quality systems necessary to ensure zero defect material (0 PPM) is supplied to USAM-USHRP1. The supplier shall be required to follow the guidelines on all requirements established in this Supplier Handbook. All correspondences, documentation, and PPAPs must be submitted in English on USAM-USHRP1's prescribed formats. All documentation must be submitted typed or printed to USAM-USHRP1's Supplier Quality Assurance representative. No hand written documents will be accepted by USAM-USHRP1.

IATF 16949 Requirements and Expectations

All current production suppliers to Hitachi Astemo Americas, Inc., shall be at a minimum, third-party registered to IATF 16949 or registered to ISO 9001:2015 with evidence of conformance to IATF 16949 unless otherwise specified in writing by the customer. If currently not compliant to these requirements, supplier must show a documented plan to achieve this certification.

Hitachi Astemo Americas, Inc., will not approve any new suppliers for production components that do not meet the above requirements. If ISO or IATF certification is revoked, supplier must immediately notify Astemo Purchasing group

Identification and Control of Critical Characteristics

Part or drawing dimensions or features may be identified by ASTEMO or Customer as a Critical Characteristic by drawing requirement or Purchasing Specification.

These characteristics may be identified with but not limited to a customer specific symbol, tombstone, SPC symbol, IQP symbol or symbol included in table below (SASG K21-09A). Additional critical characteristics may be identified by SQA.

Critical characteristics as identified on drawing must be identified in all process documentation, including but not limited to Control Plan, PFMEA, Dimensional layouts, Work instructions….etc.

Capability is required to be kept for Critical Characteristics. (See PPAP Item #11 Initial Process Capability Study.)

Supplier shall pass down all pertinent Critical Characteristics to tiered suppliers affected. Supplier shall pass down all pertinent statutory and regulatory requirements to tiered suppliers affected. Evidence that all pertinent Critical Characteristics, statutory and regulatory requirements shall be provided on request.

Table 2 Symbols indicating Special Characteristics

Kind of special characteristics	Definition	Symbol & process capability		Application	
		Cpk≧1.33	Cpk≧1.67	Vital critical parts	Important parts
Vital critical characteristics	Among the quality characteristics in vital critical areas, characteristics that have direct relation to breakage or failure that generate car accidents that are described in the above definition of the vital critical characteristics (air-tightness, screw fastening torque, etc.)	VC	VC	○	
Important varying characteristics	Characteristics of vital critical parts or important parts that agreement was made with customer and controlling of manufacturing variation is important in order to keep the target performance/function	VCN	VCN	○	○
Functional characteristics	Product/process characteristics that have a possibility to give serious affection against car functions	KC	KC		○
Noise characteristics	Among the functional characteristics, product/process characteristics that require to pay attention from the view point of noise	KCN	KCN		○
Fitting characteristics	Among the functional characteristics, product/process characteristics that have a possibility to give serious affection against fitting and/or mounting	KCC	KCC		○
Regulated special characteristics	Among product/parts other than vital critical parts, product/process characteristics that have a possibility to give serious affection against legal restrictions, car safety/product functions (relating to product liability (PL) matters)	KCL	KCL		○

Production Part Approval Process (PPAP) General Overview

Scope

The following requirements outline how to submit and identify PPAP packages and sample submissions, trial part submissions and new production components shipped to USAM-USHRP1. For Bulk, Raw, Catalog and/or Indirect parts and/or material, it is USAM-USHRP1's discretion whether PPAP will be required or not and at which level.

USAM-USHRP1's requirements for part approval consist of following the AIAG PPAP manual and USAM-USHRP1's guidelines in this Supplier Handbook. Level III PPAP submission is required unless otherwise specified by Supplier Quality Assurance. In response to the Request for Quote (RFQ) besides the cost of the parts, supplier shall submit packaging information, ELV and RoHS compliance information and IMDS information for the said part that is being quoted to

USAM-USHRP1's purchasing representative. Prior to purchase order release, a design review is to take place to outline print requirements, critical dimension designation, control plan development, and other information required for successful approval. Suppliers are also required to initiate an Advanced Product Quality Planning (APQP) Process at this time for submission to USAM-USHRP1's designated representative, with regular and timely updates until the program is completed and PPAP has been approved. Tooling will be paid for only when warrant is signed after successful PPAP and Trial Run.

USAM-USHRP1's Supplier Quality Assurance (SQA) representative determines what type of PPAP submission is required. Level III is required unless specifically advised otherwise on the PPAP request.

PPAP's are requested by SQA representative electronically through USAM-USHRP1's Electronic PPAP Database to the supplier contact via email.

Part submissions required:

1. PPAP submission part(s): One piece required for all commodity types except Chemicals. For Chemical submissions, a photo of the container and label is required. For all other commodities, one piece is required for each cavity. For parts with multiple cavities, each cavity must be clearly identified. PPAP parts are to be submitted free of charge and sent to attention of SQA.

2. Trial sample parts: 300 pieces or as described in P.O. These parts will be used for product validation trials.

PPAP sample parts should be clearly identified with PPAP Part tag. Tag can be found in the Forms section.

Definition

Production parts are manufactured at the production site using the production tooling, gauging, process, materials, operations, environment, and process settings, e.g., feeds/speeds/cycle times/pressures/temperatures etc.

Parts for Production Part Approval Process (PPAP) must be taken from a significant production run. This run would typically be from one hour to one shift's production, with the specific production quantity to total 300 parts minimum unless some other quantity has been agreed upon in writing between the supplier and USAM-USHRP1. Parts from each position of a multiple cavity die; mold, tool or pattern is to be measured and representative parts tested.

All PPAP's are to be submitted to the USAM-USHRP1 Electronic PPAP Data Base.

To access this data base:

A. www.hitachi-automotive.us

B. Select supplier tab.

C. Enter username and password.

D. Choose PPAP feature

E. A list of PPAP numbers will be shown with drawing number, click on PPAP Number to Open to

begin submission of required PPAP.

Note: Detailed Guidelines/training on using the PPAP Data Base are listed at the top of the page “HELP Information.”

Note*: All PPAP Documentation is to be submitted via electronic data base, unless approved prior to submission by USAM-USHRP1 SQA Representative.

All documents and data submitted must be in English and not more than 12 months old.

The Supplier Quality Assurance (SQA) representative will review all PPAP documents to insure they are accurate and complete. The SQA representative should confirm that all the documents marked as required on the Lotus Notes PPAP Request are included. If the PPAP is found accurate and complete, it will be submitted to USAM-USHRP1’s Layout Department for necessary dimensional inspection. If the PPAP submission is not complete, the PPAP will be rejected, and notification will be sent via email stating reasons for rejection. Correction to the PPAP is to be made and resubmitted via electronic data base. USAM-USHRP1’s Layout Department will dimensionally layout the parts and forwards the results to the Supplier Quality Assurance for final approval. A Trial Sample Run may be required, and results verified before the approval of PPAP. If parts are rejected, a resubmission may be required. (See PPAP-Trial Run Submission Diagram on page 5 of Section 2). It should be noted that USAM-USHRP1’s Layout Department requires two weeks to complete the Dimensional Layout from the time they receive the PPAP from Supplier Quality Assurance. Incomplete and inaccurate submissions of PPAP packages could cause the supplier to be charged on their Supplier Rating.

The PPAP will not be submitted to USAM-USHRP1’s Layout Department unless it is a complete and accurate package. USAM-USHRP1 will dimensionally check each part 100% if required, for conformance to print specifications. To prevent delays in acceptance of parts, the items listed in the Retention Submission Requirement’s on page 9 in section 2 for each of the submission level are to be submitted with each PPAP. The Supplier Quality Assurance section must approve any deviation from these requirements via a SREA or other form of written communication.

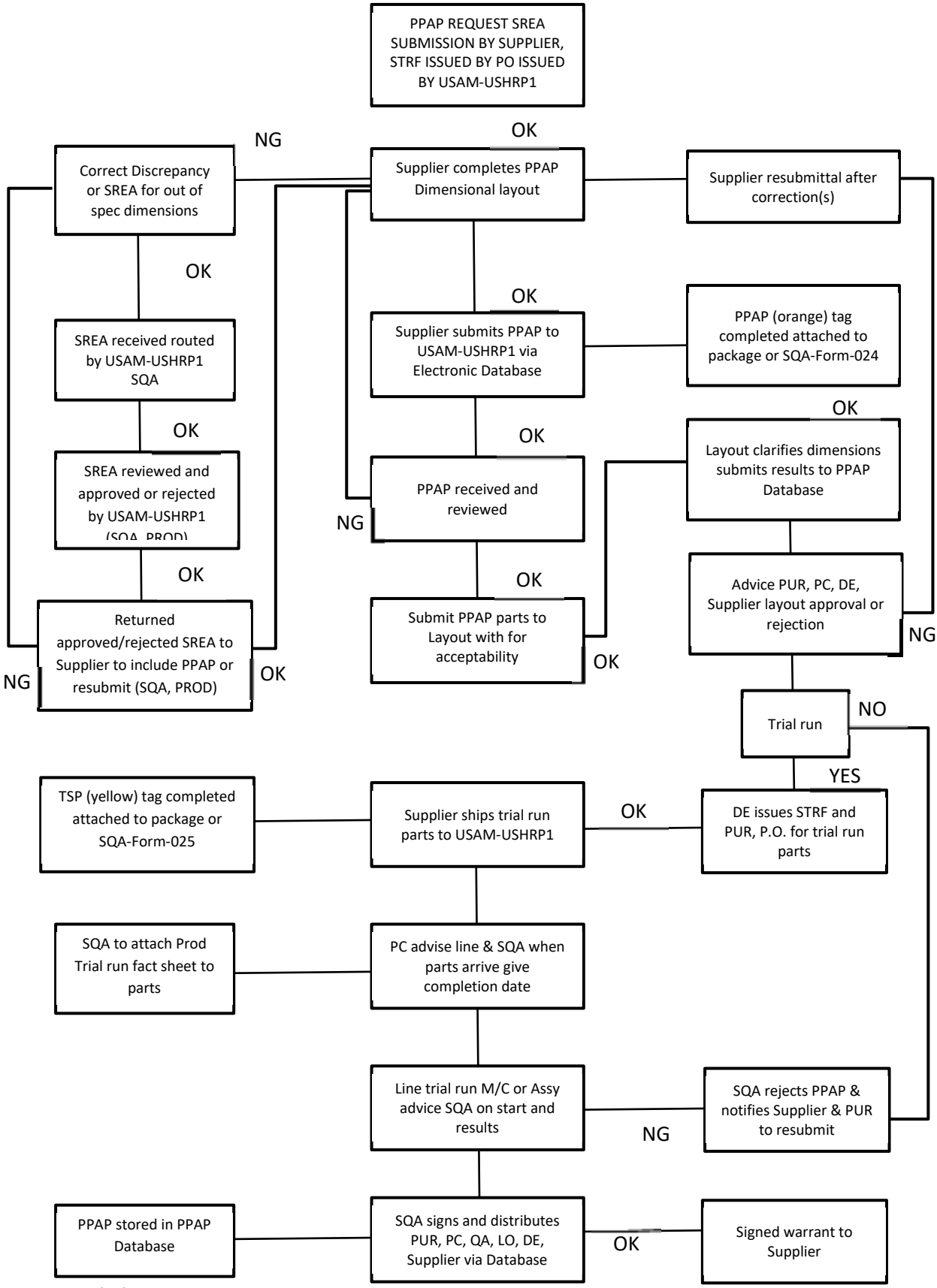
Repeated submission of incomplete and inaccurate PPAP packages shall mandate that the supplier visit Hitachi Astemo Americas, Inc. to review PPAP documents. All documents must meet Hitachi Astemo Americas, Inc. and AIAG guidelines.

Purpose

The purpose of production part approval process is to determine if all customer engineering design record and specification requirements are properly understood by the supplier and that the process has the potential to produce products meeting these requirements during an actual production run at the quoted production rate.

The main objective for the PPAP requirement is approval of new part numbers and/or approval of any changes that might affect the part and/or the final product and ultimately the customer.

PPAP I TRIAL RUN SUBMISSION DIAGRAM



NOTE:

The New Changed Product Delivery Notice (NCPDN) tag is used to identify all new product received prior to being released to production, for the first time on an order class one (1) Purchase Order,

When PPAP approved or changed parts are shipped for the first time under an order class 1 production purchase order the NCPDN Tag must be completed and affixed to the outside of the container/box.

For detailed information and instructions see pages 38, 39 and 40 of section 2 of this handbook.

When Submission Is Required

Production part approval is always required prior to the first production shipment of product in the following situations:

1) A new part or product (i.e., a specific part, material, or color not previously supplied to USAM-USHRP1).

2) Correction of a discrepancy on a previously submitted PPAP and/or part.

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

Additionally, suppliers must notify USAM-USHRP1 and submit for part approval prior to the first production shipment in the following situations unless the responsible Supplier Quality Assurance Contact has specifically waived this requirement for the subject part.

A. Use of another optional construction or material than used in the previously approved part.

B. Production from new or modified tools (except perishable tools), dies, molds, patterns, etc., including additional or replacement tooling.

C. Production following refurbishment or rearrangement of existing tooling or equipment.

D. Production following any change in process or method of manufacture.

E. Production from tooling and equipment transferred to a different plant location or from an additional plant location.

F. Change of source for subcontracted parts, materials, or services (e.g., heat-treating, plating).

G. Product re-released after the tooling has been inactive for volume production for twelve months or more.

H. Following a customer request to suspend shipment due to a supplier quality concern.

I. Following a Level One Containment due to a supplier quality concern.

The purpose of these requirements is to identify changes that might affect the direct customer or ultimate purchaser of the vehicle or component.

Primary suppliers are responsible for subcontracted materials and services.

If USAM-USHRP1 waives a formal submission, all items in the PPAP file must be reviewed and updated, as necessary to reflect the current process. The PPAP file must contain a written waiver in the form of a SREA or Fax and the name of the responsible Supplier Quality Assurance Representative granting the waiver and the date.

If there are any questions and/or concerns regarding the need for Production Part Approval Process, your Supplier Quality Assurance Representative should be consulted for clarifications.

PPAP Submissions level

USAM-USHRP1 will identify the submission level that will be used with each supplier, or supplier and part number combination. USAM-USHRP1's choice of levels for a supplier will be determined by such factors as:

Supplier compliance with IATF 9001or IATF 16949 requirements.

Supplier quality recognition/achievement status.

Part criticality and customer requirements.

Supplier's experience with prior part submissions.

Supplier's experience with similar part production.

Supplier's experience with specific commodity.

It is possible that USAM-USHRP1 will assign different submission levels to the same supplier and/or manufacturing location for the same part and/or families of part and/or similar commodity.

Submission levels are:

Level 1 - W arrant only (and designated appearance items, an Appearance Approval Report) submitted to customer.
Level 2 - W arrant with product samples and limited supporting data submitted to customer.
Level 3 - W arrant with product samples and complete supporting data submitted to customer.
Level 4 - W arrant and other requirements as defined by customer.
Level 5 - W arrant with product samples and complete supporting data reviewed at supplier's manufacturing location.

Note-Level III is the default level, to be utilized for all submissions unless specifically advised otherwise by USAM-USHRP1's designated representative.

Record Retention

Production part approval records regardless of submission level shall be maintained for the length of time that the part is active plus one calendar year.
Note: If end customer is GM, then PPAP records must be maintained the length of time that the part is active plus 50 years.

ACTIVE PART is one currently being supplied to the customer for original equipment or service application. The part remains active until tooling scrap authorization is given by the appropriate customer activity. For parts with no customer-owned tooling or situations where multiple parts are made from the same tool, written confirmation from the customer Purchasing activity is required to deactivate a part.

The supplier shall ensure that the appropriate **PPAP** records from a superseded part **PPAP** file are included or referenced in the new part **PPAP** file.

Note: An example of an appropriate document/record that should be carried forward from the old file to the new part file would be material certification from a raw material supplier for a new part that represents only a dimensional change from the old part number. Conducting a PPAP "gap analysis" between the old part numbers should identify this.

Part Submission Status

General

The supplier shall be notified by USAM-USHRP1 of the disposition of the submission. After production part approval, suppliers shall assure that future production continues to meet all customer requirements.

Customer PPAP Status

Full Approval: indicates that the part or material meets all USAM-USHRP1 specification and requirements. The supplier is therefore authorized to ship production quantities of the product subject to releases from the customer.

Interim Approval: permits shipment of material for production requirements on a limited time or piece quantity basis. Interim Approval will only be granted when the supplier has:

Clearly defined the root cause of non-conformities preventing production approval; and,

1. Prepared an interim approval action plan agreed upon by USAM-USHRP1. Resubmission to obtain "full approval" is required.

2. Material covered by interim approval that fails to meet the agreed-upon action plan either by the expiration date or the shipment of the authorized quantity will be rejected. No additional shipments are authorized unless an extension of the interim approval is granted.

The Interim Approval Authorization (IAA) is a procedure to enable suppliers to meet production part submission dates and plant production requirements for late design changes. In these cases, the supplier will receive authorization from USAM-USHRP1 through the Interim Approval Authorization (IAA) document. Parts to specification are supplied through the use of the IAA process until permanent tool/process parts are approved and available to meet production requirements. Supplier should submit a PSW along with available documentation/data and specify the reason for request, clearly stating the end of interim period.

Once parts are available from permanent tooling/process, a new submission is required.

Rejected means that the submission, the production lot from which it was taken, and accompanying documentation do not meet USAM-USHRP1 requirements. Corrected product and documentation shall be submitted and approved before production quantities may be shipped.

Requirements for Production Part Approval Process (PPAP)

The following documents and items must be completed by the supplier for each part when any of the situations listed on page 7 of Section 2, when submission is required, occurs.

1) Design Records of Saleable Product: 1A) Ballooned USAM-USHRP1 Current Release Drawing and 1B) Ballooned Manufacturer's Current Release Drawing if applicable to match the dimensional results submitted under item 9 of the required documentation as shown on the Lotus Notes PPAP request.

2) Engineering Change Documents: Copies of Product Change Notices (PCN) from manufacturer, Product Datasheet, Design Engineering Sheets if applicable.

3) Customer Engineering Approval: Supplier Request for Engineering Approval (SREA). Include approved SREA Log Number if applicable.

4) Design FMEA: if the supplier is design responsible on USAM-USHRP1's prescribed format (K1-US-001B) or equivalent AIAG forms.

5) Process Flow Diagrams: on USAM-USHRP1's prescribed format or equivalent AIAG forms.

6) Process FMEA: on USAM-USHRP1's prescribed format (Pro-Form-G2) or equivalent AIAG forms.

7) Control Plan: This includes but is not limited to the KPC, KCC, IQP, and SPC Dimensions on USAM-USHRP1's prescribed format. (QA-Form-200) or equivalent AIAG forms.

8) Measurement System Analysis Studies: Gage R & R on USAM-USHRP1's prescribed format (SQA-Form-042) or equivalent AIAG forms.

9) Dimensional Results: 100% of specifications or as specified on the SREA on (USAM-USHRP1's prescribed format (SQA-Form-018) or equivalent AIAG forms.

10) Material, Performance, Functional Results: Material Certifications (include specifications and actual results/readings). Performance and Functional results. Product validation (PV) Design Validation (D/V) Verification Results (100% of specifications or as specified on the SREA) on USAM-USHRP1's prescribed format (SQA-Form-019) and (SQA-Form-020) or equivalent AIAG forms.

11) Initial Process Study: Capability Study on all Critical Dimensions listed on the approval drawing on USAM-USHRP1's prescribed format (SQA-Form-021) or equivalent AIAG forms.

12) Qualified Laboratory Documentation (Lab Scope): Labs must comply with IATF 16949, Element 7.1.5.3. A copy of ISO/IEC-17025 certificate by a third party should be submitted here or else a complete Lab Scope. Evidence must be submitted to show

that the laboratory conducting the testing is qualified and accredited to comply with ISO/IEC-17025 requirements.

13) Appearance Approval Report: Appearance Results (for parts with color, grain, and surface finish requirements) on USAM-USHRP1's prescribed format or equivalent AIAG forms.

14) Sample Product: One piece per cavity is a part that has been obtained from PPAP run or the same run as the master sample and that has properties and measurements identical to the master sample. Individually Identified & Packaged and PPAP Part Tag (SQA-Form-024) completed & affixed to the outside of the shipping box.

15) Master Sample: This has to be retained by the supplier for the life of the program and/or as long as the part is active plus three years.

16) Checking Aids: The supplier shall submit with the PPAP submission any part-specific assembly or component checking aid.

17) Records of Compliance: This should include but not limited to the following:

A) ISO 9001:2015 or IATF 16949 Certificate

B) Temperature Profile (TP), Oven Profile (OP)

C) Packaging Approval Sheet (PAC)/ Packaging Specifications (PS):

D) End of Life Vehicles (ELV) directive

E) International Material Data System (IMDS) requirements documents

F) Moisture Sensitivity Level (MSL) for Moisture Sensitive Devices and storage and usage information as well as shelf life of the product

G) Early Production Containment (GP-12) Procedures

H) Component Supply Chain Matrix (SQA-FORM-033) Sub Supplier Readiness Matrix, PSWs and Drawings

I) CQI-9, CQI-11, CQI-12, etc. and/or CSR CQI Compliance and Self Audit(s) (**This is an annual requirement after the PPAP is approved) and Others (Explain).

18) Part Submission W arrant: The PSW shall be submitted with every PPAP per AIAG requirements. PSW shall be complete, legible, and accurate. Warrants will not be accepted that do not contain the USAM-USHRP1 part number, drawing number, drawing revision level, STRF number, Purchase Order number, and production rate. In addition to part weight, supplier authorized signature, title, and submission date on USAM-USHRP1's prescribed format SQA-Form-017 or AIAG equivalent PSW .

19) Bulk Material Requirements Checklist: Bulk Materials checklist (SQA-Form-023) must be completed and submitted with each PPAP submission by the suppliers who have been designated as Bulk Material Suppliers to USAM-USHRP1.

20) Early Production Containment Plan (GP-12) Enhanced Inspection Plan on all new and modified products.

Primary suppliers are responsible for subcontracted material and services. However, any change to the original design of the subcontracted component drawing must be approved in advance by USAM-USHRP1. Supplier's drawings for sub-supplier should be an identical reflection of all the components' drawing identified on (ASTEMO)AM's actual part drawing.

Note: All documents submitted must be in English.

1) Design Record of Saleable Product

The supplier shall have all design records for the saleable product, including design records for components or details of saleable product. W here the design record e.g., CAD/CAM math data, part drawing, specifications, is in the electronic format, e.g., math data, the supplier shall produce a hard copy (e. g. pictorial, geometric dimensioning and tolerancing sheets, drawing) to identify measurements taken.

Suppliers shall have all designs and CAD/CAM math data in a format which complies with customer specific requirements, designated by Hitachi.

For any saleable product, part or component, there will only be one design record, regardless of who has the design-responsibility. The design records may reference other documents such as Delivery Specifications, Datasheets, Supplier Request for Engineering Approval (SREA), Product Change Notices (PCN) making them part of the design record until such time the design record has been updated to incorporate any change or modifications approved through the above documents.

Ballooned USAM-USHRP1 Current Release Drawing shall always be included in this section of the PPAP package. If a ballooned Manufacturer's Current Release Drawing exists, then that should also be included in this section of the PPAP to match the dimensional data submitted under item 7 of PPAP.

1A) Ballooned USAM-USHRP1 Current Release Drawing:

(ASTEMO)AM release drawing is the official release drawing for a part or component that has been sent to the supplier after award of business. It should have a stamp with the word "released" and a date underneath it.

Ballooned drawing means that the release drawing has been sequentially numbered for all dimensions, performance specifications and notes listed on it so it could correspond with the sequential numbers on the Dimensional or Performance result Sheets.

For example, if there is a dimension on the drawing that says the length is 2.5 ±0.1 and it is the first measurement listed on the dimensional. Then this dimension on the print should be numbered 1. Since the range of this dimension would be 2.4 to 2.6 the dimensional result shown on the dimensional results sheet should be between these values for it to be acceptable.

This could also be explained as if a dimensional result is borderline or in question and the sequential number for that dimension is 23. Then the person looking at the drawing should be able to identify where that dimension 23 is on the drawing to understand the criticality of the dimension in relation to the part.

A common practice for the numbering of a drawing is that the numbers are placed inside a circle or triangle with each view of the part numbered clockwise and the drawing itself is numbered from left to right.

1B) Ballooned Manufacturer's Current Release Drawing:

When the manufacturer or supplier has the design-responsibility they may have a drawing that is a reflection of the USAM-USHRP1's release drawing. In such a case the manufacturer's drawing shall also be included in the PPAP submission.

This drawing could be a part of the datasheet or delivery specification. If this is the case, then only the page containing the drawing should be included here instead of the whole document.

This would provide the opportunity for correlation of both the USAM-USHRP1 as well as manufacturer's drawing to identify any issues or discrepancies.

Any discrepancies observed between the USAM-USHRP1 and manufacturer's drawing should be immediately brought to USAM-USHRP1's attention. It should be communicated to responsible USAM-USHRP1 SQA representative in the form of an electronic SREA. The SREA should include both the drawings and areas of discrepancies highlighted or marked for quick identification.

2) Engineering Change Documents (PCN/Datasheet/DES)

The supplier shall have any authorized engineering change documents not yet incorporated in the design record but incorporated in the product, part, process, or tooling included in this section of the PPAP Data Base.

Copies of Product Change Notices (PCN) from manufacturer, Product Datasheet, Design Engineering Sheets if applicable should be included in this section. If none exist, then a note stating this should be included in this section.

3) Customer Engineering Approval (Approved SREA)

The supplier shall have evidence of USAM-USHRP1's engineering approval for any change to the product, part, process, or components. Supplier Request for Engineering Approval (SREA) is the method for providing communication between the supplier and USAM-USHRP1. The purpose of the SREA is to have agreement between the supplier and USAM-USHRP1 on all process and design changes. **USAM-USHRP1 approval for a SREA must be obtained prior to implementing any changes.** Once USAM-USHRP1 determines that the change is possible, and a SREA is required, the supplier will submit the SREA, to the responsible Supplier Quality Assurance representative. All SREAs must provide detailed explanation of change and must be accompanied with documents, sketches, drawings, photographs, etc. highlighting the condition before and after change.

SREA approval document is on-line at www.hitachi-automotive.us, access SREA feature to create a new SREA. Follow supplier electronic SREA Database Training, if first time user. This is located on-line under the Supplier PPAP Help Information.

Process Changes

Any process changes that will affect the product in some way are covered here. It is the

responsibility of the supplier to determine the risk/benefit of the process change. It is the supplier's responsibility to report this information to USAM-USHRP1, so that both parties can make an informed decision.

A process change is defined as any change in the process that could affect its capability to meet design requirement or the durability of the product. This includes new, different, relocated, or rebuilt production equipment; any change in sub-supplier, subcontracted products, or services, including engineering approved alternate materials. Process change also includes changes in sequence of operations; and changes in chemical compounds such as adhesives, sealers, lubricants, etc., which are used in processing the product.

To further clarify this definition, lists of typical process changes are listed on page 14 under "Change Requirements Matrix". If the supplier is not sure if a process change needs a SREA, then the proper Supplier Quality Assurance representative should be contacted for clarification.

Design Changes

A SREA is required for any proposed design change to dimensional or appearance items. The related Design and Supplier Quality Assurance Engineers can then determine whether the change is functional to the end product or to our process and make a decision based on their findings.

For any proposal of a design change the supplier shall submit complete details of the proposed change as well as a validation plan and design of experiment details along with the completed SREA.

Product Change Notice (PCN)

Submission of a Product Change Notice (PCN) is not enough and does not meet USAM-USHRP1 requirements for notification of a change of any kind. The PCNs does not provide details of several important questions that we need answered on all SREAs. The PCNs might also be several months old and the changeover dates as well as sample availability dates are either in the past or very near to the submission date.

SREA is always required with the submission of a PCN. The questions that need to be answered when submitting a SREA and/or SREA+PCN are as follows.

1) Why is the change required?
2) If the change is for wafer size, or relocation from US/Europe to Asia then why no cost benefit to USAM-USHRP1?
3) Exact date when the change will take place?
4) Is there a dimensional change of any kind incorporated with the proposed changes?
    - If so, submit details with current and proposed dimensional changes.
5) Is there a marking change of any kind?
    - If so, submit example of current and proposed marking.
6) When will the new parts be available for sample trials at USAM-USHRP1?
7) When will the PPAP be available related to the change?
8) How long will the current parts be available for USAM-USHRP1 to use?
9) How will the parts from the changed product/process/location be identified?
    - If so, submit example of current and proposed changes.

Description of Request, Reason for Change, and Effect of Change should have comments and not only refer to a document.

However, reference to a document such as a PCN and a certain page in the document is acceptable as long as some narrative is present in these lines.

These could be answered either on the SREA itself or attachment that accompanies the SREA and PCN.

For Example:

Description of Request: Change of assembly and testing location from XXXX to XXXX. See page X of the attached PCN for more details

Reason for Change: As part of continuous improvement in terms of quality and service. See page X of the attached PCN for more details

Effect of Change: New assembly and testing site. Current Parts available till XX/XX/XX, PPAP available by XX/XX/XX, Changed Part's Samples available by XX/XX/XX,

The correspondence delivering the SREA should be complete and should include answers to the above questions, Properly completed SREA form, Copies of all PCNs, before and after change data Sheets, and any other reference documents related to the proposed change should be included within the same communication.

All changes (design and process) require that the supplier comply with the Production Part Approval Process (PPAP) and issue a new Part Submission W arrant (PSW) and the proper documentation. (ASTEMO)AM's Supplier Quality Assurance contact will determine when functional approval is required. Examples of Process Changes are as follows:

Change Requirements Matrix

Type of Change	Form of Notice
New Manufacturing location:	
+ New plant with new tool	Issue SREA & PPAP
+ New plant with same tool	Issue SREA & PPAP
+ Move of line inside plant	Issue SREA & PPAP
New mold/die/machine not previously PPAP'ed	Issue SREA & PPAP
Replacement of tooling:	
+ Complete new tool (i.e., die)	Issue PPAP
+ Adding cavities	Issue SREA & PPAP
+ Die rehabilitation	Issue SREA & PPAP

Resource of sub-contracted services (i.e., heat treating, plating, painting, machining)	Issue SREA & PPAP
Resource of material (i.e., raw or purchased)	Issue SREA & PPAP
Processing materials (i.e., oils, cleaning solvents, cutting fluids, etc.)	Notify Supplier Quality Assurance in writing
Change of design (i.e., material, dimensions)	Issue SREA & PPAP
Change of existing process parameters	Notify Supplier Quality Assurance in writing
Equipment rehabilitation (each machine or generic process)	Notify Supplier Quality Assurance in writing
New or modified fixturing	Notify Supplier Quality Assurance in writing
New or modified inspection process	Notify Supplier Quality Assurance in writing
Addition or subtraction of off-line operations	Notify Supplier Quality Assurance in writing
Any addition or change to a 3rd party packaging supplier or service	Issue SREA & PPAP
Others (any other change not reflected in the previously categories)	Notify Supplier Quality Assurance in writing

4) Design FMEA

Design Failure Mode and Effects Analysis (Design FMEA), if the supplier has design responsibility. See AIAG - Potential Failure Mode and Effects Analysis reference manual.

The supplier shall have a design FMEA developed in accordance with, and complaint to IATF
9001 or IATF 16949 requirements for parts or materials for which they are design responsible.

A copy of the design FMEA shall be submitted in this section of the PPAP Submission.

5) Process Flow Diagram

All PPAP submissions require a process flow diagram. The process flow diagram must be typed and printed and should be included in this submission.

The Process Flow Diagram is a visual approach to describing and developing sequential or related work activities. It provides both a means of communication and analysis for planning, development activities and manufacturing processes.

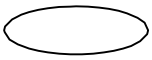
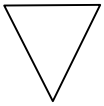
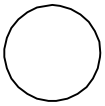
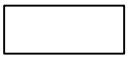
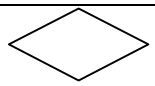
The supplier shall have a process flow diagram in supplier-specified format that clearly describes the production process steps and sequence, as appropriate and meets the specified customer needs, requirements, and expectations (see Advance Product Quality Planning and Control Plan reference manual). For bulk material, an equivalent to Process Flow Diagram is a Process Flow Description.

Supplier shall create and maintain a Process flow diagram that

represents the manufacturing process.
Ensure there is identification for inspection and rework operations.

- Document all items in the Process flow diagram with the respective nomenclature (store, move, inspect, correct, etc.).
- Standardize the use of symbols on the Process flow diagram.
- Update as changes occur.

Process Flow Diagram Symbols

Terminator (Start /End) This indicates where the Process flow Diagram starts or ends		Storage May represent 'input' (components/sub assy's or 'output' (sub assy's/finished goods)	
Operation / Process Numbered and named as per the PFMEA and Process Control Plan		Inspection – Testing An inspection point of test Numbered and named as per the PFMEA and Control Plan	
Flow Direction of flow between processes, inspection points/ test decision boxes, start / end terminators & storage		Repair Represents a Repair Process. Numbered and named as per the PFMEA and Control Plan	
Decision Send to Operation A or B?			

Notes:
The process flow number is a sequential progression in the Process Flow. It is numbered and named as per the PFMEA and Control Plan.
Process flow diagrams for 'families' of similar parts are acceptable if new parts have been reviewed for commonality.

USAM-USHRP1's Supplier Quality Assurance must approve any deviation from this format prior to submission.

When any type of change or revision is made to the process flow diagram, an updated copy must be sent to the Supplier Quality Assurance representative.

6) Process FMEA

Prior to mass production start-up, the Process Failure Mode and Effect Analysis (PFMEA) must be completed and submitted with the PPAP package. Suppliers are required to submit their PFMEA on the USAM-USHRP1's prescribed format Pro-Form-G2 provided in Section 14. This requirement will determine whether the production process is capable of producing parts that meet USAM-USHRP1's requirements.

The purpose of a PFMEA is to try to identify and address as many of the potential failure modes as possible before they occur. The PFMEA is developed based on the past experience and concerns of the team as well as new potential failure modes that are identified by individuals making up the team.

The members that make up the PFMEA team should be from all affected areas. The

engineer in charge of the project should actively involve people from design, assembly, manufacturing, materials, quality, service, suppliers, and the area responsible for the next assembly. This will promote teamwork and allow for the free exchange of ideas.

The PFMEA should be initiated before production tooling is started to allow the incorporation of preventive measures into the tooling and the process. Also, please remember that the PFMEA is a living document and must be updated each time a new failure mode is identified. This is important to show how the new failure mode was addressed and to document the problem for use in similar future products. This documentation also allows a quick reference for new members of the team to ensure that past failures are not overlooked.

The PFMEA should not rely on product design changes to correct weaknesses in the process. It should, however, take the product's design characteristics, relative to the manufacturing process, into consideration to ensure that the end product meets the customer's expectations.
For detailed information on the development of a Process FMEA, please refer to the AIAG FMEA manual. A copy of the form Pro-Form-G2 is provided in Section 14.

Note: For bulk materials, Design FMEA rankings (Severity, Occurrence, Detection) as discussed in Appendix F.7 of the AIAG PPAP manual, may be utilized to provide proper differentiation of risk factors.

7) Control Plan

Process control is the identification and planning of all production, validation, durability, testing and installation and servicing processes, which directly affect the product quality. Suppliers shall use systems to control all processes that affect quality where the absence of controls and procedures could adversely affect product quality.

Control Plans are written descriptions of the system for controlling production parts and processes. They are developed by suppliers to address the important characteristics and engineering requirements of the product they manufacture and supply to USAM-USHRP1. Each part must have a Control Plan utilizing USAM-USHRP1's prescribed form QA-Form-200 **or equivalent AIAG forms.**

In some cases, a family of products and/or parts produced using a common mold; process, material and location could utilize a common Control Plan for the complete family of parts. USAM-USHRP1's approval of the Control Plan is required prior to production part submission and the shipment of production intended parts.

Control Plan development should be started right after a design review between the supplier and USAM-USHRP1 prior to purchase order release for prototype and/or production tooling. A prototype control plan should be developed and utilized by the supplier during prototype parts submission. The prototype Control Plan must accompany any prototype part submission to USAM-USHRP1. A copy of the Control Plan QA-Form-200 is provided in Section 14.

8) Measurement System Study (Gage R & R)

Prior to mass production start-up, the measurement system study should be performed and must be submitted with the PPAP package. Suppliers are required to submit their Gage R&R study on the USAM-USHRP1's prescribed format on SQA-Form-042 provided in Section 14 of this handbook or equivalent AIAG form. This requirement will determine whether the production process is capable of producing parts that meet USAM-USHRP1's

requirements.

It is necessary to conduct a measurement system analysis to understand how measurement error is affecting the measurements. Control charts should be examined for signs of instability. If there are signs of instability, corrective action should be taken. If stability cannot be achieved, contact USAM-USHRP1 and determine appropriate action.

The supplier must perform and submit a Gage R & R study with PPAP. This is to be done on all critical dimensions (as specified on the part print) of all parts supplied to USAM-USHRP1.

The requirements for a Gage R & R are as follows:

1) A 10 piece random sample is to be used. This sample is to be taken from all shifts. Number the parts from 1–10. Each person will measure each part 3 times.

2) Inspectors should be people who normally measure the parts and are familiar with the measuring equipment. Use inspectors from all shifts.

3) Calibrate all gages before the study begins.

4) The recorder of the data can be anyone that is not the inspector.

5) A Supplier Quality Assurance auditor is to monitor and offer advice if the need arises in the study.

6) The data gathered will be submitted to the Supplier Quality Assurance Department for verification.

7) Submit data to the USAM-USHRP1 Supplier Quality Assurance section on QA-Form 581 provided in Section 14 or AIAG equivalent form.

9) Dimensional Results Requirements

Dimensional results shall be provided for every PPAP submission. Initial submissions require 100% layout, one (1) piece per cavity on the Dimensional Test Results (DTR) SQA-Form-018 included in the Handbook, Section 14. For best correlation, USAM-USHRP1 requires the measurement tool/method used to be noted next to the measurement. Actual layout parts shall be provided with the submission. These parts must be numbered so they correlate with the dimensional result page included in the PPAP.

In case of a re-submittal, the supplier needs only to submit dimensional data for critical and changed/affected dimensions, unless otherwise requested by USAM-USHRP1. Samples are also required for these submissions.

For trial parts submitted with Order Class three (3) purchase orders, which are made from prototype tooling, or before PPAP has been approved, dimensional results are required on critical dimension as specified on the design record and/or SREA/STRF and are to be submitted with samples to USAM-USHRP1 SQA along with the drawing.

A numbered drawing with the dimensional results must be submitted with all dimensional result submission and should be correlated to the DTR page.

The supplier shall provide evidence that dimensional verifications required by the design record and the Control Plan has been completed and results indicate compliance with specified requirements. The supplier shall have dimensional results for each unique manufacturing process, e.g., cells or production lines and all cavities, mold, patterns or dies.

The supplier shall indicate the date of the design record change level, and any authorized engineering change not yet incorporated in the design record to which the part was made.

The supplier shall identify one of the parts as the master sample.

The supplier shall record the change level, drawing date, and supplier name and part number on all auxiliary documents (e.g., supplementary layout results sheets, sketches, tracings, cross sections, CMM inspection point results, geometric dimensioning and tolerance sheets, or other auxiliary drawings used in conjunction with the part drawing). Copies of these auxiliary materials shall accompany the dimensional results according to the Retention/Submission Requirements Table. A tracing shall be included when an optical comparator is necessary for inspection.

Notes:

+ All dimensions must be in metric, as all of USAM-USHRP1's drawings are dimensioned using the metric system.

+ In the event a submission is submitted with dimensions out of specifications, a pre-approved SREA shall accompany the PPAP submission (See SREA Guidelines).

+ All dimensional reports must use the USAM-USHRP1 Dimensional Test Results (DTR) SQA- Form-018 found in Section 14 of the Handbook or equivalent AIAG forms.

+ USAM-USHRP1's Design Engineering Department must approve any component drawings that are modified by the supplier for sub-contracted parts and/or sub-suppliers.

+ Any changes to the original design of the sub-component drawing must be approved in advance by USAM-USHRP1. Supplier's drawings should be an identical reflection of all the components' drawing identified on (ASTEMO)AM's actual part drawing.

10) Material/Performance/Functional Results Requirements

The supplier shall perform tests for all part(s) or product material(s) when the design record or Control Plan specifies performance or functional requirements.

When Material, Validation, performance, Durability, Reliability, or other engineering requirements are on the design record, approval can occur in two ways.

a) The supplier gets approval prior to PPAP and submits evidence of approval.

b) The supplier submits the test data or results with the PPAP submission. Note that the procuring division may require an additional drawing.

All Laboratory data shall be less than one-year old at time of submission. Test data shall be

updated for engineering changes if the previous data is affected by the engineering change(s).

All laboratories used should be accredited and must comply with ISO/IEC-17025 requirements. See item 12 on page 24 for more detailed explanation.

Material Test Results Requirements

The supplier shall perform tests for all part(s) and product material(s) when chemical, physical, or the design record or Control Plan specifies metallurgical requirements.

Material tests are for the raw material like resin, wires, solder, terminals used in the production of the product or component.

The material test report, SQA-Form-020, found in Section 14 of the Supplier Handbook or equivalent AIAG form shall indicate:

> Design record change level of the parts tested, and the number, date, and change level of the specifications for which the part was tested.
>
> Date on which the test took place.
>
> Material subcontractor's name and when required by your customer, their supplier code number for the material from the customer-approved subcontractor list. For products with customer-developed material specification and a customer-approved subcontractor list, the supplier shall procure material and/or services (e.g., painting, plating, heat-treating) from subcontractors on that list.

Material Certification Requirements

The following defines Hitachi's requirements for acceptable statements of quality that identify completely the material of the part being supplied to USAM-USHRP1.

Material certifications are required to be submitted with each PPAP submission, and as required by USAM-USHRP1 on any changes that affect the material. (Follow SREA guidelines for part changes on page 12 of Section 2.) **(The actual certification, along with form SQA-Form-020 is to be submitted with the PPAP.)** SQA-Form-020 can be located in Section 14 of the Supplier Handbook.
Material certifications are required to be maintained on file at the supplier and submitted upon request by USAM-USHRP1 personnel. They are to be maintained on file for a minimum of three (3) years. **Material Certification and Material Safety Data Sheets (MSDS) are required with each shipment of chemicals.**

Material Certifications are required for all raw material, sub-components, plating, painting, hardness, etc. associated with the finished product.

In all cases the specifications or drawing are the governing factor and must be reviewed to determine the exact testing or inspection requirements. Some clarifications and examples are as follows. A certification for SAE-4/40 steel must include exact chemical analysis of the steel that is within the limits established by SAE. The practice of stating maximum or minimum limits for a given chemical element or mechanical property is not acceptable. As an example: Carbon 40% maximum or yield strength 62,000 PSI minimum must be exact specifications from that lot, with the **specifications referenced** on all submissions.

Certifications for protective coatings such as E coating or zinc chromate plating must specify the class, type and or grade to which the finished product conforms. In addition to the specification number and any special testing the material must be subjected to, including resistance testing, salt spray and adhesion testing for those coatings which must meet a specified film thickness measurements will be included on the certification.

Performance Test Results Requirements

The supplier shall have records of performance test results for tests specified on the design record or Control Plan.

The test report shall indicate:

The design record change level of the parts tested, the number, date and change level of the specifications to which the part was tested;

Any authorized engineering change documents that have not yet been incorporated in the design record.

The date on which the testing took place.

Results for all tests required by the design to related specifications should be listed in an understandable format and include the quantity tested. All performance reports must use the USAM-USHRP1 Performance Test Results (PTR) SQA-Form-019 or equivalent AIAG forms and can be found in Section 14 of the Handbook or equivalent AIAG forms.

All tests required by the design record and related specification should be listed in a convenient format along with the quantity tested and the actual results of each test. Also indicate any authorized engineering change documents that have not yet been incorporated in the design record.

Functional Test Results Requirements

The supplier shall have records of functional test results for tests specified on the design record or Control Plan The test report shall indicate:

a. The design record change level of the parts tested, the number, date and change level of the specifications to which the part was tested;

b. Any authorized engineering change documents that have not yet been incorporated in the design record.

c. The date on which the testing took place.

Results for all tests required by the design to related specifications should be listed in an understandable format and include the quantity tested. All performance reports must use the USAM-USHRP1 Performance Test Results (PTR) SQA-Form-019 or equivalent AIAG forms and can be found in Section 14 of the Handbook or equivalent AIAG forms.

All tests required by the design record and related specification should be listed in a convenient format along with the quantity tested and the actual results of each test. Also indicate any authorized engineering change documents that have not yet been incorporated in

the design record.

Design and Product Validation and Verification

DV/PV
PROCEDURES
This validates and verifies that the product design meets the customer's requirements. Design for manufacturability and assembly should be a simultaneous engineering process designed to optimize the relationship between design function, manufacturability, and ease of assembly. The scope of customer needs and expectations will define the extent of supplier's product quality team involvement in this activity.

Design reviews are regularly scheduled meetings led by supplier's design engineering activity and must include other affected areas. The design review is an effective method to prevent problems and misunderstanding. Design reviews are a series of verification activities that are more than an engineering inspection. At a minimum design review should include evaluation of:

Design and functional requirements considerations
Formal reliability and confidence goals
Component/subsystem/system duty cycle
Computer simulation and bench test results
Review of the design for manufacturability and assembly effort
Design of experiment (DOE) and assembly build variation results
Test failures
Design verification progress

A major function of the design reviews is the tracking of the design verification progress. The supplier should track design verification progress through the use of a plan and report format.

Product and Process Validation and Verification:

Production validation testing refers to engineering tests that validate products made from production tools and processes meet engineering standards. It is the obligation of all suppliers to meet customer requirements on all characteristics. Special characteristics must meet the indices specified by the customer. Robust controls should be implemented within the process control plans and work instructions to manage pass-through characteristics.

The manufacturing process and products must be validated through an evaluation of production trial run. During a production trial run, the Production Quality Team should validate that the control plan and process flow chart are being followed and that the product meets customer requirements. Additional concerns should be identified for investigation and resolution prior to regular production run. Production trial runs must be conducted using production tooling, equipment, environment (including production operators who have been trained), and facility and cycle time. Process reviews are a series of verification activities that are more than an engineering inspection. At a minimum, process reviews should include evaluation of:

1) Packaging Standards

2) Process Quality Review

3) Process Flow Chart

4) Floor Plan Layout

5) Characteristics Matrix

6) Process Failure Mode and Effect Analysis

7) Pre-Launch Control Plan

8) Work Instructions

9) Measurement System Analysis

10) Preliminary Process Capability Studies

11) Initial Process Capability Study

Prior to mass production start-up, the process capability must be determined. This requirement will determine whether the production process is capable of producing parts that meet USAM-USHRP1's requirements.

A 125 piece grouped in 25 sets with each set having five data points should be used for each capability study. Capability study is required on critical dimensions and/or dimensions that are decided upon during the design review. The capability study must be performed prior to and submitted with the PPAP documentation. This capability study should show that the process capability is greater than 1.67 Ppk.

In the case where acceptable process capability cannot be achieved by the part submission date, an action plan should be submitted detailing either how the process will be improved to achieve 1.67 Ppk, or how the parts will be inspected to ensure that defective material does not reach (ASTEMO)AM.

Typical corrective actions include process improvement, tooling changes, etc. Dimensions that require process capability during mass production must be maintained, as referenced on the control plan and data and results must be maintained at the supplier and made available upon request to USAM-USHRP1.

Note: Selected suppliers will be required to submit this data, at a minimum, annually. These suppliers will be notified in writing by (ASTEMO)AM Supplier Quality Personnel for submission of this data.

Suppliers are required to submit Process Capability Study including $\bar{X}$ and R charts.

For new parts, a Ppk of 1.67 or higher must be maintained on all critical dimensions or the supplier will be required to perform a 100% inspection for that specification until proven capability is achieved.

For existing parts that have been modified or improved or the processes have been changed, a CPK of 1.33 or higher must be maintained or the supplier will be required to perform a 100% inspection for that specification until proven capability is achieved.

Failure to maintain accepted controls and continuous capability could place the supplier under the Supplier Quality Improvement Plan (SQIP).

The CPK is to be calculated for all dimensions that are determined to be SPC dimensions by (ASTEMO)AM Design Engineering. These dimensions will be indicated with an SPC symbol on the USAM-USHRP1 drawing. In the event that there is no SPC symbol, then the

supplier should submit data on the dimensions indicated as IQP dimensions. The IQP dimensions will be marked with a tombstone symbol. If neither one of these are present on the print, then the dimensions will be determined by USAM-USHRP1 Design Engineering and Supplier Quality Assurance and relayed to the supplier by the Supplier Quality Assurance representative. The PPK must be 1.67 or higher on all established dimensions.

Preliminary Process Capability Study including $\overline{X}$ and R Charts (PPK of 1.67 or higher must be maintained on all critical dimensions), or supplier will be required to perform a 100% inspection for that specification until proven capability is achieved. For existing parts, a CPK of 1.33 or higher must be maintained on all critical dimensions.

Note: (ASTEMO)AM's Capability Study Summary, SQA-Form-022 located in section 14 or equivalent AIAG form is to be used for the summary submission.

12) Qualified Laboratory Documentation (Lab Accreditation):

In compliance with IATF 16949 requirements all suppliers shall submit their internal as well as external laboratory accreditation in each PAPP submittal to USAM-USHRP1.

Whenever a PPAP includes material, durability, or performance testing from your internal lab or an external lab, you must submit evidence of the following items. Evidence must be submitted to show that the laboratory conducting the testing is qualified and accredited to comply with ISO/IEC-17025 requirements.

You must include the lab accreditation with each material certificate submitted within the PPAP. Lab scope documentation must also be included with material certificates to show evidence of specific test accreditation. The lab accreditation number and scope should be included on or attached to all test reports.

Internal lab: If you are ISO 9001:2015 or IATF 16949 certified supplier and performing testing on your own products, you must include your laboratory scope that includes its capability to perform the required inspection, test, or calibration services. Refer to IATF 16949, Element 7.1.5.3.

External lab: If an external lab is used for inspection, test, or calibration services the supplier shall have a defined laboratory scope that includes the capability to perform the required inspection, test or calibration and be accredited to ISO/IEC 17025 or national equivalent. All outside labs require ISO/IEC 17025 accreditation which must also be site specific for that laboratory. Refer to IATF 16949, Element 7.1.5.3.

13) Appearance Approval (AAR)

Appearance Results (for parts with color, grain, and surface finish requirements).
A separate Appearance Approval Report (AAR) must be completed for each part or series of parts for which a submission is required if the product/part has appearance requirements on the design record, USAM-USHRP1 drawing or supplier drawing.

Upon satisfactory completion of all required criteria, the supplier shall record the required information in an understandable manner. SQA-Form-020 Material Test Result could be used for recording of appearance criteria and results.

Note: AAR typically applies only for parts with color, grain, protrusions, texture, stains, flow

lines, plating, and surface appearance requirements.

14) Sample Product

All PPAP submissions at submissions Levels II, III, and IV require that one piece per cavity actual product samples should be included with the PPAP package. A part that has been obtained from PPAP run or the same run as the master sample and that has properties and measurements identical to the master sample shall be used for the Sample product. All samples must be a true reflection of the production intent part that would be supplied once PPAP approval has been received by the supplier.

These samples should come from an actual PPAP run at the supplier with production intent and approved material, part, tooling, equipment, processes, facility, and environment including production operators who have been properly trained.

All samples submitted with the PPAP should be individually packaged and clearly identified per cavity, tool, product lines, and processes before inclusion in the PPAP submission. An identical sample should be retained by the supplier to be used as a master sample at their facility.

A separate request in the form of a Sample Tool Request Form (STRF) and Purchase Order (PO) could be issued to the suppliers for trial or functional samples for validations of the design, product, equipment, and processes at USAM-USHRP1. If trial run samples have been ordered at the time of PPAP order a PPAP will not be approved unless the trial run has taken place at USAM-USHRP1, and all parameters of the component has been found to be acceptable as per the specification. After successful completion of the trial run at USAM-USHRP1 and after any additional product or design validation testing the PPAP will be approved, and the supplier would be authorized to ship production intent parts.

15) Master Sample

The supplier shall retain a master sample for the same period as a) the production part approval records, or b) at least three years after the part has been phased out by USAM-USHRP1, or c) at least three years after the part has been changed in any way and a new master sample has been produced.

The supplier shall retain master sample for each position of a multiple cavity die, mold, tool, pattern, equipment, test stand, or production process unless otherwise specified and approved by USAM-USHRP1's SQA representative in writing.

Note 1: When part size, sheer volume of parts, etc. makes storage of a master sample difficult, the sample retention requirements may be modified or waived in writing by the designated USAM-USHRP1 SQA representative. The purpose of the master sample is to assist in defining the production standard, especially where data is ambiguous or in insufficient detail to fully replicate the part to its original approved state.

Note 2: Many bulk material properties are by their nature time dependent, and if a master sample is required it may consist of the manufacturing record, test results, and certificate of analysis of key ingredients, for the approved submission sample.

16) Checking Aids

If requested by USAM-USHRP1, the supplier shall submit with the PPAP submission any part-specific assembly or component checking aid.

The supplier shall certify that all aspects of the checking aid agree with part dimensional requirements. The supplier shall document all released engineering design changes that have been incorporated in the checking aid at the time of submission. The supplier shall provide for preventive maintenance of any checking aids for the life of the part

Note: Checking aids can include fixtures, gages, models, templates, Mylars, connectors, test equipment specific to the product.

17) Records of Compliance

The supplier shall have records of compliance to all applicable USAM-USHRP1 a specific requirements. All documents and information pertaining to USAM-USHRP1's specific requirements should be included in this section of the PPAP package.

Information such as the following items should be included here in the order listed.

17A) ISO 9001:2015 or IATF 16949 Certificate:

A current copy of the above certifications by a third party registrar should be included here. This should clearly show the company name and address where the parts are being manufactured, tested and packaged. If there are multiple locations then it should list all locations used for the production, testing, and packaging of the part. In case of an electronic part, it should show both the Front-end (Wafer & Die) as well as Back-end (Assembly, Testing & Packaging) facilities location

17B) Temperature Profile (TP)/ Oven Profile (OP):

A copy of the temperature profile for the reflow process as well as the oven profile for baking or burn in should be included in this section if applicable to the saleable product.

17C) Packaging Approval Sheet (PAC)/ Packaging Specifications (PS):

Supplier shall submit detailed information about all the packaging options and the preferred method of packaging in which the saleable part will be shipped to USAM-USHRP1. The packaging approval sheet should be completed and submitted for approval prior to submittal of PPAP. Supplier's packaging specifications should also be included here if applicable to the saleable part.

A completed and approved copy of the packaging Approval Sheet (PM-Form-040) **should be included in the PPAP package in this section.**

17D) End of Life Vehicles (ELV) directive:

This directive is aimed at increasing recycling content of vehicles manufactured and sold in the European Union. This directive only applies to automotive vehicles and took effect July 1, 2003. In particular, the directive bans or limits the use of lead, mercury, cadmium, and hexavalent chromium.

All suppliers should provide information about ELV Directive compliance in this section of the PPAP package.

Restriction on Hazardous Substances (RoHS) directive:

The other two directives are Restriction on Hazardous Substances (RoHS) and Waste Electrical and Electronic Equipment (WEEE). These directives are aimed at reducing the hazardous materials content in electronic products as well as increasing the recycling efforts

for these products and take effect July 1, 2006. RoHS specifically bans or restricts the use of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated biphenyl ethers (PBDE).

All suppliers should provide information about RoHS Directive compliance in this section of the PPAP package.

17E) International Material Data System (IMDS):

The IMDS is the automotive industry material data system. It is a joint development of Audi, BMW, DaimlerChrysler, Ford, Opel, Porsche, VW and the Swedish firm Volvo. Further manufacturers have meanwhile joined the community and talks are being held with others regarding their participation in IMDS.

In the IMDS, all materials used for car manufacture are archived and maintained. Only in this way is it possible to meet the obligations placed on car manufacturers, and thus on their suppliers, by national and international standards, laws, and regulations.

All suppliers should provide information about IMDS Directive compliance in this section of the PPAP package along with the product ID and IMDS datasheet.

17F) Moisture Sensitivity Level (MSL) for Moisture Sensitive Devices and storage and usage information as well as shelf life of the product:

Overexposure to uncontrolled room environment can lead to internal component damage during the reflow process due to moisture expansion. This creates invisible cracks in the die, breaks in wire bonds, and delamination (known as “Pop Corning”). The final result can be latent field failures undetectable by testing at the assembly process.

Exposure to higher temperatures needed for lead free processing can increase the potential for defects associated with moisture sensitive devices. This increases the risk of having latent failures caused by poor handling of Moisture Sensitive Devices.

Suppliers shall provide the Moisture Sensitivity Level (MSL) for Moisture Sensitive Devices (MSD) and Chemical Labeling Requirements for Shelf Life

All chemicals that are supplied shall have the (ASTEMO)AM Part Number, Date of Manufacture, Date of Expiration, and recommended Storage Conditions on each individual Container.

The Packing Slip also shall have the (ASTEMO)AM Part Number and Expiration Date. All

information on the containers and packing slip shall be in English.

Failure to comply with these requirements will result in lot rejection and (ASTEMO)AM policy for non-conforming material will apply.

Storage and usage information as well as shelf life of the saleable product:

17G) Early Production Containment (GP-12) Procedures

Enhanced Inspection Plan on all new and modified products.

This procedure applies to all suppliers required to use the Production Part Approval Process (PPAP). It is to be used for all pre-production and production requirements that require the

Production Part Approval Process.
The purpose of GP- 12 is to document the supplier's efforts to gain control of its processes during start-up and acceleration so that any quality issues that may arise are quickly identified and corrected at the supplier's location and not at the customer's manufacturing location. GP-12 Early Production Containment requires a Pre-Launch Control Plan a significant enhancement to the supplier's production control plan which will raise the confidence level to ensure that all products shipped initially will meet customer's expectations. The pre-launch control plan will also serve to validate the production control plan. The Pre-Launch Control Plan should take into consideration all known critical conditions of the part as well as potential areas of concern identified during the Production Part Approval Process. GP-12 Early Production Containment serves to proceduralize the Pre-Launch Control Plan referred to in section 3.7 of the AIAG Advanced Product Quality Planning and Control Plan Reference Manual.

The Supplier must do the following:

A. Establish a containment process that contains the following elements:

- Identification of the person responsible for the containment process.
- Development of a Pre-Launch Control Plan consisting of additional and enhanced controls, inspection audits and testing to identify non-conformances during the production process. Depending on the dominant factor if the production process (set-up, machinery. fixture. tooling. operator. material/components, preventative maintenance, climate) additional controls could include:
- Increased frequency/sample size of receiving process and or shipping inspections
- Mandated sub-supplier containment and or sub-supplier support/audits
- Addition of inspection/control items
- Increased verification of label accuracy
- Enhancement of process controls, such as error proofing
- Error proofing validation through introduction of known defects
- Increased involvement and visibility of top management
- Prompt implementation of containment/correction when non-conformances are discovered
- Identification of the measurement equipment and data collection devices/activities to be used where applicable

B. Document the Pre-Launch Control Plan, including functional testing and error proofing, using the Control Plan format referenced in the Advanced Product Quality Planning and Control Plan Reference Manual. The development and documentation of the Pre-Launch Control Plan are expected to occur during the Advanced Product Quality' Planning process. The Pre-Launch Control Plan is not a substitute for the Production Control Plan but is over and above the Production Control Plan and is used to validate it.

C. Utilize the Early Production Containment Plan for all pre-production requirements (e.g., pilot, lead unit build) and for the production ship quantity or duration specified by the procuring division or until the Production Control Plan is validated, whichever occurs later. Typically, the specified production quantity or duration is intended to reflect the customer's acceleration plan to full production rate. If not specified by the procuring division, the production ship

quantity is a minimum of 1200 pieces for each customer plant, in addition to any pre-production quantities required.

D. To indicate compliance with the GP-12 requirements, attach to each shipping label, container, box, package a completed green NCPDN tag (SQA-Form-026), found in Section 14 of the Supplier Handbook, signed by a designated senior management representative along with a contact number. Please see pages 38, 39, and 40 under heading "New Changed Product Delivery Notice" for detailed instructions on how to complete and submit an NCPDN Tag.

Supplier will be eligible to exit Early Production Containment on its own accord after meeting the criterion listed below. If the supplier is unable to meet the exit criteria or the supplier's GP- I 2 plan continues to identify non-conformances the supplier is expected to continue the necessary containment measures to insulate the Customer Plant up to the time when the quality concerns have been resolved to the satisfaction of both the Supplier and the Customer and the Supplier's Production Control Plan is validated.

A. Ship the number of pieces or for the duration specified by the procuring division with no discrepancies or customer plant SCARs and supplier can self-exit from the Early Production Containment Process

B. If supplier does not meet self-exit criteria, then to exit GP-12 all SCARs must be closed by the Customer Plant

C. In the event the self-exit criteria has been met but the GP-12 plan continues to identify non- conformances, the GP-I2 plan must be kept in place until process controls and capabilities have proven effective, and the Production Control Plan is validated.

Note: This procedure does not provide authorization to ship nor is it a shipping schedule.

17H) Component Supply Chain Matrix (SQA-FORM-033) Sub Supplier Readiness Matrix, PSWs and Drawings

The supplier shall submit a sub-tier component matrix of all their suppliers along with approved PSW s and other supporting documentation as agreed upon by the supplier and (ASTEMO)AM SQA.

17I) AIAG (Automotive Industry Action Group) Special Process Assessments (CQI) and Customer Specific Requirement (CSR) CQI

This directive mandates that all suppliers that supply components to Hitachi Astemo Americas, Inc. meet the requirements of all applicable CQI special process audits. As CQI requirements change it is the responsibility of the supplier to ensure they are including updated and relevant CQI (and CRS CQI) as part of their annual submittal. Check for the audit(s) that apply, (additions may be made to this list as added by AIAG and customers):

CQI 9-Heat Treating*

CQI 11-Plating*

CQI 12-Coating*

CQI 15-Welding

CQI 17-Soldering* (Ford FEMR may apply)

CQI 23 Molding*

CQI 27 Casting*

CQI-29 Brazing

CQI-30 Rubber Processing System Assessment

Ford-specific Assembly Assessment

Ford Additive Manufacturing Process Assessment

Ford Contamination Assessment (FCMR)

Ford Specific Casting Assessment

Ford EDS Wiring Assessment

Note 1: Asterisk (*) denotes required Ford Specific CQI is required in addition to AIAG CQI assessment, if applicable.

These assessments are used to evaluate an organizations ability to meet the requirements in the assessments, as well as customer, regulatory, and the organization's own requirements. The development of these systems provides for continual improvement, emphasizing defect prevention and the reduction of variation and waste in the supplier's processes. These assessments are intended for automotive production and service part components.

All special process assessments, to include applicable CSR assessments, shall be conducted annually to re-examine the continuing compliance with the requirements. These assessments shall include a review of the supplier's special process systems. The assessments shall use the process approach to auditing as identified by the requirements of IATF 16949. CSR CQI assessments shall use the process approach as described within the specific CSR audit form.

This applies to all direct suppliers and sub-tier suppliers that have processes that fall under these categories. All suppliers must also submit these assessments to (ASTEMO)AM, every year, as required. These assessments are also required at the time of PPAP for new component submission.

If, the parts you supply do not involve any of these processes, please include a detailed explanation on company letterhead why the part is not applicable to this directive and submit with PPAP documentation under section 17I.

Note: Information can be found at www.aiag.org . CSR CQI forms are available on the Supplier Portal in the Forms Section.

Any other relevant document that the supplier would like to include.

17J) Bulk Material Requirements

For bulk materials, the Bulk Materials requirements Check sheet shall be completed and jointly agreed between the supplier and USAM-USHRP1's SQA representative. All specified requirements should be completed unless specifically agreed and indicated as "Not Required" (NR) on the checklist.

Bulk Materials checklist (ASTEMO)AM Form, (SQA-Form-023) must be completed and submitted with each PPAP submission by the suppliers who have been designated as Bulk Material Suppliers to (ASTEMO)AM.

Additional requirements may be specified by USAM-USHRP1's SQA representative either via SREA, E-Mail or on the checklist itself as deemed necessary due to the nature of product or

the nature of the program where the material will be used.

17K) Others

Level 3 PPAPs (and any other PPAP as specified by SQA)submitted by suppliers to USAM-USHRP1 that ultimately have Nissan as customer shall include form : Pre-production quality control index (USAM-USHRP1 Form number). This shall be required of any part that is not a commodity or standard catalog item.

Any additional documentation or items agreed upon by the supplier and (ASTEMO)AM SQA.

18) Part Submission Warrant (PSW) SQA-Form-017

Upon satisfactory completion of all required measurements and tests, the supplier shall record the required information on the Part Submission Warrant (PSW).

A separate PSW shall be completed for each USAM-USHRP1 part number unless otherwise agreed by the (ASTEMO)AM SQA representative in writing. A copy of this written agreement shall also be submitted with the PSW containing multiple part numbers.

The supplier shall verify that all of the measurements and test results show conformance with USAM-USHRP1's requirements and that all required documentation is available (or for Level II, III, and IV, is included in the submission). A responsible supplier representative shall approve the PSW and in doing so shall certify that all documents, measurements, test results etc. contained in the PPAP is accurate and current, and provide date, title, and contact number.

Instructions for completing Part Submission Warrant

SQA-Form-017 - Numbers below correlate with example form, section 2, page 34.

1) **Part Name -** Name of the part should be listed here as it appears on Hitachi's drawing or as it is commonly known.

2) **Part Number with Suffix** - Hitachi Part Number should be listed here including all suffixes.

3) **Drawing Number** - Hitachi Drawing number should be listed here.

4) **Engineering Drawing Change Level -** Hitachi Drawing Revision level should be listed here. If original or initial drawing write zero "0".

5) **Dated -** Drawing release date by (ASTEMO)AM should be listed here.

6) **Additional Engineering Change -** Approved SREA number if any should be listed here.

7) **SREA Request Reason -** Reason for which SREA was submitted and approved, example dimensional, functional, other etc.

8) **Dated -** SREA approval date should be listed here.

9) **Checking Aid Number -** Enter the checking aid number, if one is used for dimensional and/or functional inspection.

10) **Engineering Change Level -** Enter the engineering change level of the checking aid, if one is used for dimensional and/or functional inspection

11) **Dated -** Checking aid approval date should be listed here if one is used for inspection.

12) **USAM-USHRP1 STRF Number -** USAM-USHRP1 issued STRF number must be included on all PSW for tracking at (ASTEMO)AM. It could be found on the P. O. If none is available supplier to contact responsible (ASTEMO)AM Buyer to receive one.

13) **Due Date -** PPAP due date as listed on STRF or P. O. should be included here.

14) **Purchase Order Number -** P. O. number must be included on all PSW for tracking at (ASTEMO)AM. If none is available, then supplier must contact responsible (ASTEMO)AM Buyer to obtain one.

15) **Dated –** P. O. issue date should be listed here.

16) **Safety and/or Government Regulations -** "Yes" if so, indicated on the part drawing otherwise "No."

17) **Safety and/or Government Regulations** "No" if so, indicated on the part drawing otherwise "Yes."

18) **Supplier Reference Number -** This area is for the supplier or manufacturer's part number and any other reference.

19) **Weight -** Enter the actual weight in kilograms to four decimal places for the part.

20) **Supplier Name -** Supplier's name that supplies the part directly to (ASTEMO)AM should be included here regardless of who the manufacturer is of the part. Manufacturer's name if different from the supplier could be included here after the supplier's name separated by a slash.

21) **Supplier Code -** Supplier code provided by (ASTEMO)AM should be listed here.

22) **PPAP Submission Information -** Check appropriate box as it pertains to the submission. Indicate the reason of submission (If other is checked then please explain).

23) **Street Address -** Physical street address of the supplier's facility.

24) **Customer Name Division -** This should be Hitachi Astemo Americas, Inc.

25) **Application / Product Line -** This should be (ASTEMO)AM OEM product name or production line name where the part is being used.

26) **City, State Zip -** Physical street address, city, state, zip code of the supplier's facility

27) **(ASTEMO)AM SQA -** (ASTEMO)AM Supplier Quality Assurance representative's name must be included here.

28) **(ASTEMO)AM Buyer -** (ASTEMO)AM Procurement representative's name must be included here.

29) **Restricted or Reportable Substances -** Check the appropriate box to indicate if the part contains any restricted or reportable substance and that the part is ELV/RoHS Compliant. If the answer is yes, then please explain in detail.

30) **IMDS ID No –** Submitted by IMDS or other customer format. Enter the IMDS ID number from the IMDS website.

31) **ISO Marking on Plastic Parts -** Check the appropriate box to indicate if the parts are marked with appropriate ISO markings. If the answer is yes, then please explain in detail.

32) **Reason for Submission -** Check the appropriate box as it pertains to the submission. One or more boxes should be checked. If other is checked, then please explain in detail.

33) **Requested Submission Level -** Check the appropriate box identifying the requested submission level by (ASTEMO)AM, If PPAP Level IV is checked then also circle or highlight the items 1 through 20 that you are submitting in the PPAP submittal.

34) **Submission Results –** Check the appropriate boxes as it pertains to the submission. If the results do not meet the requirements, then a brief explanation of why all results do not meet drawing and specification requirements should be included here.

35) **Declaration -** Number of parts produced for an 8-hour shift including lunch and breaks should be listed here.

36) **Explanation/Comments -** A brief explanation of why a PPAP is being submitted should be included here. Reference to an SRAE or PCN could be mentioned here if the PPAP is being submitted as a result of an approved SREA. If the reason for submission is other, then use this area to elaborate.

37) **Is each customer tool properly tagged and numbered –** For process with tools.

38) **Name -** Name of Supplier representative responsible for submission of PPAP should be listed here.

39) **Title -** Job Title of the person submitting this PPAP should be listed here.

40) **Fax Number -** Fax number of the person submitting this PPAP should be listed here.

41) **E-Mail** - E-mail of the person submitting this PPAP should be listed here.

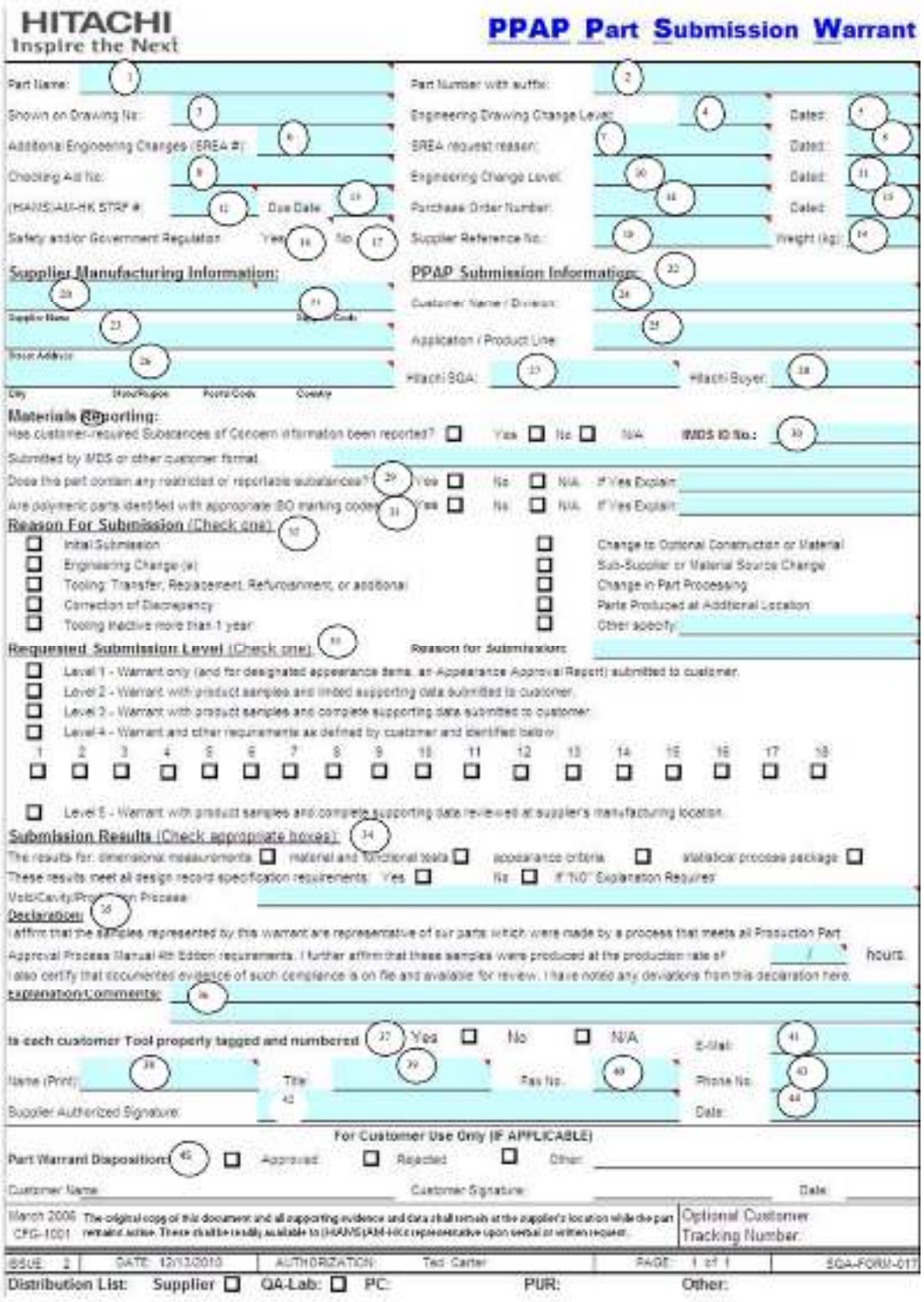
42) **Supplier Authorized Signature -** This PSW must be signed by authorized Supplier QA/Sales Contact responsible for (ASTEMO)AM account

43) **Phone Number -** Phone number of the person submitting this PPAP should be listed here.

44) **Date -** PPAP submission date to (ASTEMO)AM should be listed here.

45) **For Customers Use Only -** Leave blank for use by USAM-USHRP1's Supplier Quality Assurance Representative.

Incomplete and inaccurate submissions of PPAP packages could cause delay in part approval activity. A complete resubmittal could be required, and the supplier could be charged on their Supplier Rating.



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PPAP Part Submission Warrant

Part Name: (1) | Part Number with suffix: (2)

Shown on Drawing No: (3) | Engineering Drawing Change Level: (4) | Dated: (5)

Additional Engineering Changes (SREA #): (6) | SREA request reason: (7) | Dated: (8)

Checking Aid No: (9) | Engineering Change Level: (10) | Dated: (11)

(HAAS)AM-HK STRF #: (12) | Due Date: (13) | Purchase Order Number: (14) | Dated: (15)

Safety and/or Government Regulation: Yes (16) No (17) | Supplier Reference No.: (18) | Weight (kg): (19)

Supplier Manufacturing Information:

(20) | (21)
Supplier Name (22) | Supplier Code
Street Address (23)
City | State/Region | Postal Code | Country

PPAP Submission Information: (24)

Customer Name / Division: (25)
Application / Product Line: (26)
Hitachi SQA: (27) | Hitachi Buyer: (28)

Materials Reporting:

Has customer-required Substances of Concern information been reported? ☐ Yes ☐ No ☐ N/A **IMDS ID No.:** (30)
Submitted by IMDS or other customer format
Does this part contain any restricted or reportable substances? (29) ☐ Yes ☐ No ☐ N/A If Yes Explain:
Are polymeric parts identified with appropriate ISO marking codes (31) ☐ Yes ☐ No ☐ N/A If Yes Explain:

Reason For Submission (Check one) (32)

- ☐ Initial Submission
- ☐ Engineering Change(s)
- ☐ Tooling: Transfer, Replacement, Refurbishment, or additional
- ☐ Correction of Discrepancy
- ☐ Tooling inactive more than 1 year
- ☐ Change to Optional Construction or Material
- ☐ Sub-Supplier or Material Source Change
- ☐ Change in Part Processing
- ☐ Parts Produced at Additional Location
- ☐ Other specify:

Requested Submission Level (Check one) (33)

Reason for Submission:

- ☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
- ☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
- ☐ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
- ☐ Level 4 - Warrant and other requirements as defined by customer and identified below:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

- ☐ Level 5 - Warrant with product samples and complete supporting data reviewed at supplier's manufacturing location.

Submission Results (Check appropriate boxes) (34)

The results for: dimensional measurements ☐ material and functional tests ☐ appearance criteria ☐ statistical process package ☐
These results meet all design record specification requirements: Yes ☐ No ☐ If "NO" Explanation Required:
Mold/Cavity/Production Process: (35)

Declaration:

I affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition requirements. I further affirm that these samples were produced at the production rate of ____ / ____ hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from this declaration here.

Explanation/Comments: (36)

Is each customer Tool properly tagged and numbered (37) ☐ Yes ☐ No ☐ N/A E-Mail: (41)

Name (Print): (38) | Title: (39) | Fax No.: (40) | Phone No.: (43)

Supplier Authorized Signature: (42) | Date: (44)

For Customer Use Only (IF APPLICABLE)

Part Warrant Disposition: (45) ☐ Approved ☐ Rejected ☐ Other:

Customer Name | Customer Signature | Date

March 2006 CPG-1001 The original copy of this document and all supporting evidence and data shall remain at the supplier's location while the part remains active. These shall be readily available to (HAAS)AM-HKG representative upon verbal or written request.

Optional Customer Tracking Number:

ISSUE: 2	DATE: 12/13/2010	AUTHORIZATION: Teo Carter	PAGE: 1 of 1	SQA-FORM-017

Distribution List: Supplier ☐ QA-Lab: ☐ PC: PUR: Other:

PPAP Part Tag (Bright Orange)

This TAG (SQA-Form-024) found in Section 14 of the Supplier Handbook, must be used for all PPAP submission packages to USAM-USHRP1, one piece per cavity, identified on the outside of shipping container and/or package etc. This Tag is for Order Class Seven (7) Purchase Order (PO) only. Tag must be visible on the outside of packaging next to the shipping invoice for proper receiving.
Instructions for completing a (SQA-Form-024) Production Part Approval Process (PPAP) Tag:

1. **Supplier Name –** Indicate the name of the supplier who is submitting the parts.
2. **Supplier Code** – Indicate the supplier code associated with the supplier.
3. **Supplier Contact –** Indicate the name of the supplier contact for USAM-USHRP1.
4. **Contact Number –** Indicate the phone number for the supplier contact person.
5. **Type of Submission –** Check one box for reason of submission.
6. **Level of Submission –** Check the PPAP level of submission, as required by USAM-USHRP1 Supplier Quality Assurance.
7. **SQA Contact –** Indicate the name of the SQA contact at USAM-USHRP1 who is responsible for the supplier.
8. **Buyer –** Indicate the name of the buyer at USAM-USHRP1 who is responsible for the supplier.
9. **Quantity –** Indicate the quantity of parts being submitted (as required on the SREA, STRF and/or Purchase Order).
10. **Part Name –** Indicate the name of the parts being submitted, as referenced on part approval drawing**.**
11. **Drawing Number** – Indicate the Hitachi part number of the parts being submitted, including any suffix.
12. **Drawing Level –** Indicate the drawing revision level.
13. **STRF Number –** Indicate the STRF number as provided by USAM-USHRP1.
14. **PO Number –** Indicate the PO number, as provided by USAM-USHRP1.
15. **Order Class –** This number must be an order class seven (7) Purchase Order issued only for PPAP.
16. **All PPAP documentation must be submitted prior to receipt of parts**
17. **Remarks –** Any remarks made by the supplier should be mentioned here like the SREA number or PCN number for which the PPAP is being submitted.
18. **Remarks –** Indicate why this PPAP is being submitted? What has changed or is it an initial submission? Are these produced with different equipment, process, or location?

Note: The supplier must attach this tag to all PPAP submittal packages and/or parts box, crib, or pallet. This Orange Tag would be supplied by USAM-USHRP1. In the event that this tag is not available, suppliers could make a copy of this tag from the master included in this Handbook and also in the accompanying disk on a Bright Orange piece of paper.

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PPAP PART TAG

PRODUCTION PART APPROVAL PROCESS

SUPPLIER TO COMPLETE			
SUPPLIER NAME: (1)		SUPPLIER CODE: (2)	
SUPPLIER CONTACT: (3)		CONTACT NUMBER: (4)	
TYPE OF SUBMISSION: (5)	INITIAL SUBMISSION	RESUBMITTAL	ENGN / DRWG / PROCESS CHANGE
LEVEL OF SUBMISSION (6)	I	II	III	IV	V
SQA CONTACT: (7)	BUYER: (8)	QUANTITY: (9)	
PART NAME: (10)	DRAWING NUMBER: (11)	DRAWING LEVEL: (12)	
STRF NUMBER: (13)	P O NUMBER: (14)	ORDER CLASS: (15)	
THIS PACKAGE MUST BE COMPLETE AND SHOULD INCLUDE ALL REQUIRED DOCUMENTATIONS. (16)	CORRECT LEVEL OF PPAP IDENTIFIED PARTS/CAVITY TWO COPIES OF ALL DOCS.	REMARKS/COMMENTS: (17)	

REMARKS / COMMENTS
(18)

Issue: 0	Date: 02/17/05	Authorization: Ted Carter	Page: 1 of 1	SQA-Form-024

This PPAP Part Tag must be printed on Bright Orange color paper.

Sample Packaging and Shipping Requirements:

Samples for initial evaluation, or production, process, design, component, and location changes should only be submitted under an order class 3 sample purchase order. Samples are required to be delivered to USAM-USHRP1 on the due date listed on the purchase order sent by responsible buyers. Only a USAM-USHRP1 purchasing representative can issue a Sample PO. USAM-USHRP1 Production Control does not possess the capability to issue sample PO.

Trial Sample Part Tag (Bright Yellow)

This TAG (SQA-Form-025), found in Section 14 of the Supplier Handbook, must be used for all Sample submission packages to USAM-USHRP1. This Tag is for Order Class Three (3) Purchase Order (PO) only. Tag must be visible on the outside of packaging next to the shipping invoice for proper receiving.

1) Instructions for completing (SQA-Form-025) the Trial Sample Part (TSP) Tag: **Supplier Name** – Indicate the name of the supplier who is submitting the parts.

2) **Supplier Code – Indicate the supplier code associated with the supplier.**

3) **Supplier Contact – Indicate the name of the supplier contact for USAM-USHRP1.**

4) **Contact Number – Indicate the phone number for the supplier contact person.**

5) **SQA Contact – Indicate the name of the SQA contact at USAM-USHRP1 responsible for the supplier.**

6) **Buyer – Indicate the name of the buyer at USAM-USHRP1 who is responsible for the supplier.**

7) **Quantity – Indicate the quantity of parts being submitted (as required on the SREA, STRF and/or Purchase Order).**

8) **Part Name – Indicate the name of the parts being submitted, as referenced on the part approval drawing.**

9) **Drawing Number – Indicate the Hitachi part number of the parts being submitted, including any suffix.**

10) **Drawing Level – Indicate the drawing revision level.**

11) **STRF Number – Indicate the STRF number as provided by USAM-USHRP1.**

12) **PO Number – Indicate the PO number, as provided by USAM-USHRP1.**

13) **Order Class – This number must be an order class three (3) Purchase Order issued only for trial samples.**

14) **Purpose of Samples – Indicate the purpose of the samples being submitted i.e., trial run, line set up, CPK study etc.**

15) **Remarks/Comments – Indicate why these samples are being submitted? What has changed in the part or processes? Are these produced with different equipment, process, or location?**

Note: The supplier must attach this tag to the outside of the shipping container/box of all sample parts for identification purposes. This Yellow Tag would be supplied by USAM-USHRP1. In the event that this Tag is not available, suppliers could make a copy of this Tag from the master included in this Handbook and also in the accompanying floppy disk on a Bright Yellow piece of paper.

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TSP TAG
TRIAL SAMPLE PART

SUPPLIER TO COMPLETE SUPPLIER		
SUPPLIER NAME: (1)	CODE: (2)	
SUPPLIER CONTACT: (3)	CONTACT NUMBER: (4)	
SQA (5)	BUYER (6)	QUANTIT (7)
PART (8)	DRAWING (9)	DRAWING (10)
STRF (11)	P. O. (12)	ORDER (13)
PURPOSE OF SAMPLES: (14)		

REMARKS / COMMENTS
(15)

Issue:	Date:	Authorization: Ted	Page: 1 of	SQ -FOR -025

This TSP Tag must be printed on Bright Yellow color paper.

New Changed Product Delivery Notice (Bright Green)

The New Changed Product Delivery Notice (NCPDN) tag is used to identify all new product received prior to being released to production, for the first time on an order class one (1) Purchase Order, or any product received after any change that are shipped on an Order Class three (3) Purchase Order after a deviation such as an SREA, process change, visual and functional inspection as part of a containment, countermeasure implementation, etc. This includes any new part delivered to USAM-USHRP1 from a supplier with intent of mass production on an Order Class One (1) Purchase Order (PO).

The supplier is to initiate form:

A) Form to be filled out completely by the supplier.

B) Supplier must E-Mail or Fax a completed copy of the NCPDN to the designated representatives of (ASTEMO)AM Supplier Quality Assurance (SQA), Purchasing Buyer, and Production Control (PC) sections. This must be done at-least twenty-four hours prior to the arrival of shipment at USAM-USHRP1 or on same day parts ship from supplier, whichever is earlier. It should have the date and time of arrival of the parts at USAM-USHRP1 in the remarks/comments section of the Tag.

C) The form must be completed and affixed to all the Pallet/Tote/Box/Reel/Tube that are shipped under the same purchase order (P. O.). It should also be affixed near the packing slip.

Instructions for completing the New/Changed Product Delivery Notice:

1) **Supplier Name** – Indicate the name of the supplier submitting parts.

2) **Supplier Code –** Indicate the supplier code found on the supplier release.

3) **Supplier Contact –** Indicate the name of the supplier contact for USAM-USHRP1.

4) **Contact Number** – Indicate the phone number of the person who completed the NPDN tag.

5) **SQA Contact** – – Indicate the name of the SQA contact at USAM-USHRP1 responsible for the supplier.

6) **Buyer Name** – Indicate the name of the buyer at USAM-USHRP1 who is responsible for the supplier.

7) **Quantity** - Indicate the quantity of parts being submitted (as required on the SREA, STRF and/or Purchase Order).

8) **Part Name –** Indicate the name of the parts being submitted, as referenced on the part approval drawing.

9) **Drawing No. –** If the drawing number has changed indicate the new drawing number.

10) **Drawing Level –** Indicate the drawing revision level

11) **SREA Number –** Indicate the SREA number if any that was approved authorizing this change.

12) **Requirements –** Indicate the requirements listed on the approved SRAE **authorizing this** change.

13) **Approval Date –** Indicate the approval date of the SREA.

14) **STRF Number -** Indicate the STRF number as provided by USAM-USHRP1.

15) **P.O. Number –** Indicate the P.O. number the parts are shipped against.

16) **Order Class -** This number could be an order class one (1) or three (3) Purchase Order issued for production intent or trial samples

17) **New/Changed Item Description –** Indicate what has changed for these parts.

18) **Changed Approved Through –** Indicate how was the changed approved via an SRAE, STRF, DES, PCN, Audit, result of a countermeasure etc.

19) **Remarks/Comments** – Indicate why these samples are being submitted? What has changed in the part or processes? Are these produced with different equipment, process, or location?

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NCPDN TAG

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SUPPLIER TO COMPLETE		
SUPPLIER NAME: (1)	SUPPLIER CODE: (2)	
SUPPLIER CONTACT: (3)	CONTACT NUMBER: (4)	
SQA CONTACT: (5)	BUYER: (6)	QUANTITY: (7)
PART N AME: (8)	DRAWING NUMBER: (9)	DRAWING LEVEL: (10)
SREA NUMBER: (11)	REQUIR EMENTS: (12)	APPROVAL D ATE: (13)
STRF N UMBER: (14)	P. O. NUMBER : (15)	ORDER CLAS S: (16)
NEW/CHANGED ITEM DESCRIPTION: (17)		
CHANGED APPROVED THROUGH: (18)		

REMARKS / COMMENTS
(19)

Issue: 0	Date: 02/17/05	Authorization: Ted Carter	P age: 1 of 1	SQA-FORM-026

This NCPDN Tag must be printed on Bright Green color paper.

Local Part Certification “Ship to Stock”

The USAM-USHRP1 certification program is based on part number level basis, to enforce supplier process quality controls at the manufacturing source, eliminate USAM-USHRP1 incoming inspection, and improve parts flow for JIT environment. The

program is maintained and controlled by Supplier Quality Assurance.

All suppliers are expected to have a quality system in place that will allow them to achieve and maintain “Ship to Stock” certification on all parts supplied to USAM-USHRP1. Any supplier not capable of maintaining certification status will be evaluated on a case-by-case basis with potential for loss of new or existing business.

In order to obtain certification, (Ship to Stock) status the following requirements must be met by the supplier:

1) The part must be from a supplier who is on the approved supplier list.

2) A complete Level III PPAP must have been submitted and accepted.

3) A minimum of 10 consecutive lots must be received and accepted in incoming, (The incoming check consists of critical dimensions as identified on the print, and a visual inspection using the C=0 AQL standards. Please see AQL table below. And run on the production line with no quality or assembly problems

4) A Process Flow Diagram, Process Control Plan, and PFMEA with all critical characteristics identified (as specified on the drawing) must be in the possession of USAM-USHRP1 Supplier Quality Assurance.

5) Statistical data must be maintained by the supplier and available to USAM-USHRP1 within 24 hours of request and submitted quarterly.

6) Material certification must be kept on file at the supplier facility and made available to USAM-USHRP1 within 24 hours of request.

C0 Sampling Plans
Associated A Q L ’s

	0.0 4	0.0 6 5	0.1 0	0.1 5	0.2 5	0.4 0	0.6 5	1.0	1.5	2.5	4.0	6.5	1 0.0
L ot S ize	Sample Size												
2 to 90	*	*	*	80	50	32	20	13	8	7	6	5	4
91 to 1 5 0	*	*	1 25	80	50	32	20	13	1 2	11	7	6	5
1 51 to 2 8 0	*	2 00	1 25	80	50	32	20	20	1 9	13	10	7	6
2 81 to 5 0 0	3 15	2 00	1 25	80	50	48	47	29	2 1	16	11	9	7
5 01 to 1 2 0 0	3 15	2 00	1 25	80	75	73	47	31	2 7	19	15	11	8
1 2 0 1 to 32 0 0	3 15	2 00	1 25	1 2 0	11 0	73	53	42	3 5	23	18	13	9
3 2 0 1 to 10 0 0 0	3 15	2 00	1 92	1 8 9	11 0	86	68	50	3 8	29	22	15	9
1 0 0 0 1 to 35 0 0 0	3 15	3 00	2 84	1 8 9	13 5	10 8	77	60	4 6	35	29	15	9
3 5 0 0 1 to 15 0 ,0 0	4 80	4 76	2 84	2 1 8	17 0	12 3	96	74	5 6	40	29	15	9

7) The part must be listed in the International Material Data System (IMDS). Information and IMDS-ID as well as a copy of the IMDS datasheet for the product must be in the possession of USAM-USHRP1 Supplier Quality Assurance.

8) The part must have the Moisture Sensitivity Level (MSL) for Moisture Sensitive Devices listed and storage and usage information as well as shelf life of the product must be in the possession of USAM-USHRP1 Supplier Quality Assurance.

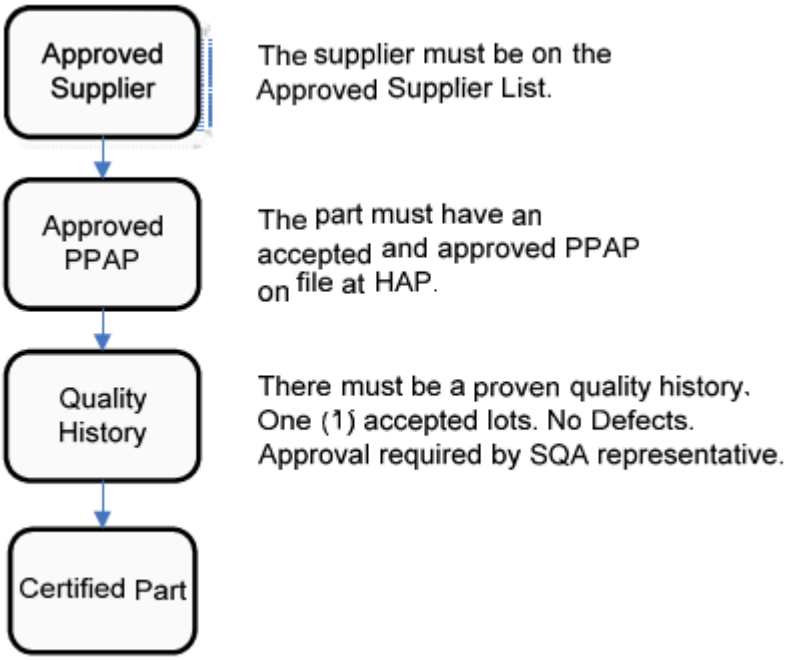
De-Certification occurs when a certified part is determined to be a non-conforming product. At this time, the part will be taken off the certified parts list and incoming

inspection will be done for a minimum of 3 lots (longer if deemed necessary by the Supplier Quality Assurance representative). In addition, at this time a corrective action may be issued to the supplier. If the specified number of incoming lots has passed inspection with no defects found, the certified status will be reinstated.

NOTE: Supplier data must be maintained at the supplier for USAM-USHRP1 reference as requested, such as material certification (including raw material, plating, coating, paint, etc.). This information must be made available to USAM-USHRP1 within 24 hours of request.

NOTE: Selected components manufactured overseas, chemicals, and bulk materials can at USAM-USHRP1's discretion by-pass the Level III PPAP requirements for Ship to Stock certification.

Certified Part Process Flow Chart



Non-Conforming Product

1) Traceability / FIFO of Supplied Components

The supplier shall have the ability to trace lots of material shipped to USAM-USHRP1 by using (ASTEMO)AM Purchase Order and Delivery Order numbers. For production lots, an Order Class One (1) Purchase Order is used for production order releases. USAM-USHRP1 daily production sheets (DPS) use the P.O. system for all part traceability. Supplier must also be able to trace by (ASTEMO)AM P.O. and receive date at USAM-USHRP1 back to the sub-supplier if required when requested by (ASTEMO)AM.

First in first out (FIFO). Components shipped to USAM-USHRP1 must be shipped in the order as manufactured by Date code/Lot code FIFO.

2) Containment of Non-Conforming Product

If parts are found to be defective (i.e.: do not meet specification, does not fit or function properly on assembly line, cosmetic related, etc.), the supplier will be contacted to provide immediate containment and support to resolve the problem.

The supplier is responsible to immediately contain the problem at their facility, parts in transit, and parts at (ASTEMO)AM. If (ASTEMO)AM must sort supplier parts to keep production assembly line with defect free components the supplier will be charged for the sort. If (ASTEMO)AM must sort finished goods for supplier problems, only USAM-USHRP1 personnel will be used, and the cost will be charged back to the supplier. Other charge-back costs may include material shipping or handling, (ASTEMO)AM direct and indirect labor and contract services. See charge- back section page 44 of Section 2.

If production assembly line is shut down due to supplier part quality problem, supplier will be responsible for costs incurred. The total cost involved would depend on the actual time lost, labor cost, loss of revenue, measures needed to make up lost time, inconvenience to production, inconvenience to customer, cost of expedited delivery and any other related costs.

If supplier detects a non-conforming product prior to shipment to USAM-USHRP1, the supplier must immediately determine the extent of the problem and take action to immediately correct. If suspect material is released to ship, the supplier must notify USAM-USHRP1's Supplier Quality Assurance representative and identify the material. The supplier is responsible for sorting, rework, or removing parts at (ASTEMO)AM. If the problem cannot be corrected immediately, a deviation may be required from (ASTEMO)AM Supplier Quality Assurance contact.

3) Hold Tag Charge-back

Each MAR/HOLD TAG written at (ASTEMO)AM has an associated cost. The costs associated with the writing, the investigation, and the disposition each hold tag has been absorbed by (ASTEMO)AM in the past. (ASTEMO)AM will no longer carry the cost burden of hold tags that are driven by defective product shipped by suppliers. The cost of each hold tag, determined to be supplier responsibility, **will be debited $150.00 per hold tag**.

4) Supplier Corrective Action Request

The supplier shall be responsible to implement Corrective Action on non-conforming material found at (ASTEMO)AM to prevent reoccurrence of the problem.

If Supplier Quality Assurance requests a corrective action on a problem, the guidelines to follow are: (1) Documented containment on the SCAR form (SQA-Form-008) within 24 hours, (2) Final 8-D is due 14 days from the issuance of the SCAR form. Late and incomplete responses could result in supplier rating charge.

A 100% containment must stay active until the verification section of the Supplier 8-D is complete and the Supplier 8-D is accepted by (ASTEMO)AM. A corrective action can also be issued for other issues not directly related to part problems, such as low supplier rating, etc.

5) Supplier 8-D Reports

Final response to SCARs should be in Supplier 8-D format, TYPED, with as much detail of the problem and countermeasures as possible. This shall include implementation dates and a verification of the countermeasure (ex: sorting for x number of days after countermeasure to assure it is working). The supplier is responsible for defining the root-cause of the problem,

taking corrective action to prevent reoccurrence.

If a supplier continues to ship defective product to USAM-USHRP1 and cannot implement process controls to assure zero defects; USAM-USHRP1 may opt to implement Level I containment of product by sorting, with the supplier being responsible for the costs involved.

Daily Defect Monitoring System

(ASTEMO)AM has instituted a system of tracking all supplier in-process defects. The purpose of this system is to detect potential problems and correct them before they become larger problems. This system will allow (ASTEMO)AM and (ASTEMO)AM suppliers to react more quickly to parts issues and eventually reduce the number of line claims related to supplier parts problems. It will also give more accurate tracking of defect costs and supplier quality.

Parts Tracking Method

As defective components are identified on the (ASTEMO)AM assembly line, a red tag will be placed on the defective component / assembly. This tag will detail the information needed to track the part / assembly back to the supplier of the defective component. Each part that is found by (ASTEMO)AM production will be reviewed by (ASTEMO)AM Supplier Quality Assurance and logged in the defect database. The parts will then be accumulated for shipment back to the supplier or shipped back to the supplier immediately depending on the nature and urgency of the problem. An RMA number will be requested via fax, phone call or e-mail for the defective components. If an RMA number is not issued within 24 hours, the parts will be shipped without the number. It is the responsibility of the supplier to follow-up once the RMA request is issued. Supplier is responsible for all shipping costs. Supplier must provide a Federal Express or UPS account number to be used for shipment of non-conforming parts.

Reporting Requirements

Each defective component is returned for the purpose of investigating the cause of the problem. A full report of the root-cause and countermeasure for the problem is expected in a timely manner. **A corrective action request will not be issued in all cases; however, a Supplier 8D report is always required.**

Supplier Rating

Defects found using this system will be charged to the PPM rating portion of the Supplier Rating. PPM rating is an integral part of the quality portion of the (ASTEMO)AM Supplier Rating. Tracking of daily in-process defects will give a clearer picture of each supplier's true performance using the PPM rating system.

Charge-back of Sort / or Other Related Costs Due to Non-Conforming Material Sort

1) Defective Components Found At USAM-USHRP1

If defects warrant a MAR/HOLD TAG Supplier Corrective Action Request or complaint from incoming inspection, production assembly line, or customer complaints, and are confirmed to be a supplier quality problem, suppliers will be notified by USAM-USHRP1 personnel, i.e.: Supplier Quality Assurance, Purchasing, Design Engineering, etc.

This will warrant an immediate containment of suspected parts at USAM-USHRP1, at the supplier, and any parts in transit. Material must be sorted 100% to insure defect free parts, and a continuous supply of parts to USAM-USHRP1.

Upon contact from USAM-USHRP1, suppliers will have the option to send representatives to USAM-USHRP1 to sort or provide replacement parts. Depending upon the availability of defect free material. USAM-USHRP1 may be required to sort material to supply the production assembly line until defect free parts are received. The supplier **will be** responsible for any charges incurred in sorting of the defective material. Material will continue to be sorted until defect free parts are received. **USAM-USHRP1's current hourly labor rate charge is $45.00 per hour.** If a supplier defect causes a USAM-USHRP1 finished product sort, USAM-USHRP1 will sort to verify stock and all charges incurred will be the responsibility of the supplier.

USAM-USHRP1 also may opt for supplier chargebacks that include lost production time due to machine downtime, jam-ups, and material handling of defective components. Teardowns, of line defects/assembly returns from customers, expedited delivery from suppliers and to customers, etc.

2) Component / Assembly Charge-back

The cost of defective components found to be the responsibility of the supplier would be debited back to the supplier. The full cost of the assembly, up to the point of detection of the defect, will be debited back to the supplier. If the defect results in a sort, the supplier will be responsible for all costs related to the sorts as covered in the Charge-back Section.

3) Failure to Contain Defective Parts from Suppliers (Level 1 Containment)

If a supplier cannot implement a permanent corrective action to supply zero defects to USAM-USHRP1 and recurring problems continue, (ASTEMO)AM will implement a 100% sort at (ASTEMO)AM of supplier components to ensure no recurring problems. The charges incurred will be the responsibility of the supplier. This may continue until the supplier has demonstrated the ability to ship defect free material on a continuous basis. Level 1 containment would also require implementation of SQIP program and supplier would be banned from quoting any new business.

Debit for Hold Tags Written For Defective Supplier Material

Each hold tag generated for defective supplier material will be debited at a charge of $150.00 per hold tag. These charges are the result of handling and processing non-conforming product from the supplier.

Guidelines and Policies for In-House Sorts by Suppliers or Subcontractors

When it is necessary for a supplier to sort or rework components at USAM-USHRP1, they must comply with all safety guidelines and policies established. The Supplier Quality Assurance section will contact and work with the supplier in organizing and setting the criteria necessary to successfully complete the sort or rework in a timely manner. No parts shall be removed without authorization from USAM-USHRP1 Supplier Quality Assurance personnel.

The supplier must supply all equipment, tools, safety glasses, earplugs, etc. necessary to perform the sort or rework.

Any fixture, gauge or equipment provided or used by supplier must have evidence that it is in supplier calibration system and calibration is current. Use of said equipment must be documented in sort work instruction.

The supplier will be expected to stay until an adequate number of components are sorted or reworked to sustain production. Upon completion of the sort or rework, the parts must be clearly identified with tags supplied by USAM-USHRP1's Supplier Quality Assurance department to signify the sort is completed.

The supplier is required to maintain a log of all parts sorted and individual non-conformances found per bag, box, tote, pallet, reel, tube or whatever the individual packaging the parts are received in. This should be recorded on forms supplied by USAM-USHRP1's Supplier Quality Assurance Personnel.

The supplier is required to clean up all trash, dunnage, and any excess material left from sorting and reworking.

When a supplier is at USAM-USHRP1 to sort or rework parts, the dress and safety code requirements are as follows. These must be strictly adhered to with no exceptions.

1) NO SHORTS OR DRESSES

2) NO OPEN TOE SHOES, SANDALS, OR HIGH HEELS

3) NO TORN JEANS, NO TANK TOPS

4) NO SHIRTS OR HATS WITH INAPPROPRIATE OR OFFENSIVE WRITING OR LOGOS

5) ALCOHOL OR DRUGS WILL NOT BE TOLERATED

Supplier Rating

The Supplier Quality Assurance Section of the supplier rating is a measurement of the conformance of part quality and documentation supplied to USAM-USHRP1 for each period. Please refer to Section 5 for more information about Supplier Rating.

The Quality Section of the supplier rating is divided into three sub sections:

1) PPM

This section utilizes the method of PPM calculation (Parts Per Million): (Total Rejected / Total Received) x 1,000,000 = PPM

The PPM section uses 25 of the 35 possible points. Suppliers are charged based on number of defects per number of parts supplied.

If PPM is less than or equal to the target level for that commodity, all PPM points are awarded.

If PPM is greater than the target level and less than the Maximum allowable, then a percentage of the PPM points are awarded. If PPM is greater than the maximum allowable, then zero (0) PPM points will be awarded.

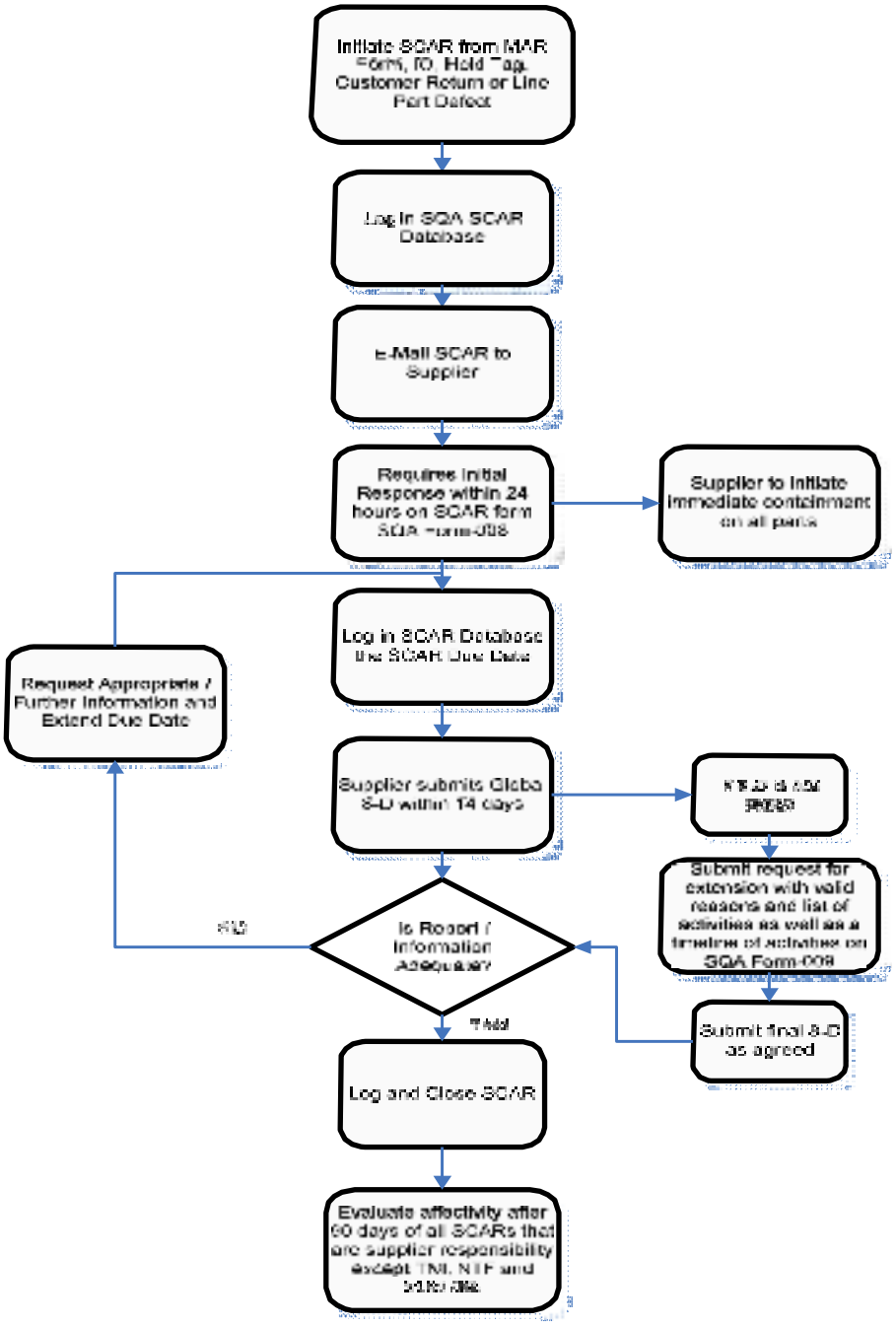
2) Certifications

There is a total of 5 points possible for obtaining the needed certifications (IATF 16949 or ISO 9001:2015)

3) Documentation

This section is used to track proper submission of documents, effective communication, and supplier responsiveness. There is a total of 5 points possible, utilizing points off system.

Supplier Corrective Action Request (SCAR) SCAR Flow Chart



SCAR Guidelines

1) Initial containment action for parts at USAM-USHRP1's inventory (Receiving Warehouse, WIP, and Finished Goods).

2) Initial containment actions for parts at the supplier to ensure that additional part with this condition is not shipped.

3) Method of conforming material Verification, ID and Tractability on parts and/or packages and/or pallets.

4) Conforming material ship date from manufacturing location.

5) Initial written response is due within 24 hours upon receipt of the SCAR with actual/potential root cause(s), root cause verification, countermeasure(s) implementation dates identified. Note: Immediate containment is required upon any notification by (ASTEMO)AM personnel if prior to receipt of SCAR.

6) Final Supplier 8-D is due within 14 days upon receipt of this SCAR with actual root cause(s), root cause verification, countermeasure(s), countermeasure(s) verification and countermeasure(s) implementation dates identified.

It is expected that the SCAR response shall be submitted by designed dates. Any failure to submit the response and/or the Supplier 8-D's within the above mentioned timeframe could result in a charge to the supplier rating.

In the event that an acceptable and completed Supplier 8-D cannot be submitted by the date, then a request for an extension of the date(s) should be submitted in writing with detailed explanation of why an extension is necessary.

Instructions for completing the Supplier Corrective Action Request form (SQA-Form-008):

This form is to be completed by the Supplier Quality Assurance representative at USAM-USHRP1 and issued to the supplier in the event a non-conforming product is found.

The supplier is responsible to complete sections 20 through 23 and respond accordingly with the guidelines outlined here.

1) **SUPPLIER** – The name of the supplier responsible.

2) **CONTACT** – The name of the person contacted at the supplier to inform them of the defect found.

3) **PHONE NO.** – Phone number of the supplier contact that was notified of the defect.

4) **SUPPLIER RMA NUMBER** – Tracking number for parts returned to supplier.

5) **CUSTOMER RMA NUMBER** – Tracking number for customer returns.

6) **CUSTOMER LOG NUMBER** – Tracking number for customer returns.

7) **SCAR NUMBER** – Indicates the SCAR number obtained from the external corrective action database.

8) **I/O or CCAR NUMBER** – Internal/external customer CAR number as issued to SQA.

9) **DATE OPENED** – Date the SCAR is issued.

10) **PART NUMBER** – Indicates the drawing number of the part the SCAR is being issued for, including the suffix.

11) **PRODUCT LINE** – Indicates the product line the parts are used on at USAM-USHRP1.

12) **P.O. NUMBER** – Indicates the P.O. number related to the defective parts.

13) **PART NAME** – Indicates the name of the part for which the SCAR is being issued.

14) **MAR/HOLD TAG NUMBER** – Indicates the hold tag number for the parts the SCAR is issued.

15) **DATE RECEIVED** – Indicates the date the parts were received at USAM-USHRP1.

16) **QUANTITY DEFECTIVE** – Indicates the quantity of defective parts.

17) **DEFECTED AT** – Indicates where the defect was found.

18) **PROBLEM** – Indicates if the problem is new, reoccurring, or chronic.

19) **NON-CONFORMANCE** – Indicates type of defect.

20) **SUPPLIER CONTAINMENT ACTION** – Supplier to describe the containment action taken.

21) **CONFORMING MATERIAL VERIFICATION, IDENTIFICATION & TRACEABILITY** – Supplier to indicate method of identification for conforming parts.

22) **CONFORMING MATERIAL SHIPPING DATE** – Supplier to indicate the shipment date of conforming parts.

23) **SUPPLIER SIGNATURE** – Signature, title and date of the designated supplier representative completing the form.

24) **REASON FOR EXTENSION** – Supplier to complete if 8D cannot be submitted by due date. This should be as detailed as possible and the SQA-Form-009 Electronic FAR Timeline should also be completed and submitted showing the complete timeline from SCAR issue date till today. What has (ASTEMO)AM opened as far as investigation, when, where the part has traveled etc.

25) **NEEDED UNTIL** – How long is the extension needed for to complete final 8-D.

26) **SUPPLIER SIGNATURE** – Signature, title and date of the designated supplier representative completing the extension.

27) **APPROVED** – For USAM-USHRP1 use only.

28) **COMPLETED FINAL SUPPLIER 8-D DUE ON OR BEFORE** – Indicates the date 8-D is

due to USAM-USHRP1 Supplier Quality Assurance.

29) **SIGNATURE** – Indicates the signature of the Supplier Quality Assurance representative.

30) **DATE CLOSED** – Indicates the date SCAR was closed.

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Supplier Corrective Action Request

Supplier	Supplier RMA No.	SCAR No.
Contact E-Mail	Customer RMA No.	IO Number
Phone No.	Customer Log No.	Date Opened

Part Number:	Product Line:	P.O. No.:
Part Name:	MAR/HT No.:	Date Rec.:
Quantity Defective:	Detected at: ☐ Incoming ☐ Product Line ☐ Customer	
	Problem: ☐ New ☐ Recurring ☐ Chronic	

Non-Conformance (Describe): (Attach Photos/Sketches as needed to clarify description)

To be Completed by Supplier and returned to Hitachi SQA contact within 24 hours of SCAR receipt

Supplier Containment Action:

Conforming Material Verification, Identification & Traceability	Conforming Material Shipping Date:

Supplier Signature: Title: Date:

SCAR Extension Request Only

Reason For Extension:	Needed Until:	
Supplier Signature: Title: Date:		APPROVED

To be Completed by Hitachi Supplier Quality Assurance Representative

Supplier Quality Assurance Contact:	Completed Final Global 8-D Due on or Before: 01-30-00
	Signature:
E-Mail Responses To: #N/A	Date Closed:

Effectivity (30 days after closure) Date Effectivity Checked: _____

Evaluation Method: _____

Evaluated By: _____ Title: _____ Date: _____

Evaluated By: _____ Title: _____ Date: _____

Supplier 8-D Report

Instructions for completing a Supplier 8-D Report, SQA-Form-011:

This form is to be completed by the supplier when requested by Supplier Quality Assurance for a defect found and returned to USAM-USHRP1 within 30 days.

1) **SCAR No**. – Indicate SCAR number for which the 8-D is being submitted.

2) **IO Number** – Internal/external customer CAR number as issued to SQA.

3) **USAM-USHRP1 Part Number-** Indicate the part number including suffix.

4) **Supplier Part Number** – Indicate the manufacturer part number if different from USAM-USHRP1 part number.

5) **Part Name-** Indicate the name of the part for which the 8-D is being submitted.

6) **Date Opened** – Indicate date 8-D was opened (should be same as the SCAR open date).

7) **8D Last Updated** – Indicate date of last update for this 8-D.

8) **8D Revision Level** – Indicate revision number for this 8-D (should start at '0').

9) **RMA Number** – Tracking number for customer returns as provided in SCAR-Form-008.

10) **Log Number** – Tracking number for customer returns as provided in SCAR-Form-008.

11) **Number of Part(s) Affected** – Indicate how many total parts are affected due to the issue including actual confirmed failures as well as suspected to fail.

12) **Returned Part(s) Date codes** – Indicate the date codes of the actual confirmed failures.

13) **Suspect Date code(s) Lot code(s)** – Indicate the date code of parts suspected to fail.

14) **Supplier Organization Information** – Indicate the supplier responsible for the 8-D and their address.

15) **DØ Symptom(s)** – Describe the symptom(s) of the defect.

16) **DØ Emergency Response Action(s)** – Detail any Emergency Response Action(s) taken.

17) **Verification / Validation** – Define how the Emergency Response Action(s) was verified and validated.

18) **(%) Effective** – Indicate the Emergency Response Action's effectiveness.

19) **Date Implemented** – Indicate the implementation date of the Emergency Response Action(s).

20) **D1 Team** – Establish a team, pick members of your company who should be involved in solving this defect. Choose a Champion and Team Leader. List names, titles, and phone numbers.

21) **Department** – Indicate the departments these team members are involved with

22) **Phone** – Indicate the contact numbers for the team members.

23) **D2 Problem Statement** – Simply state the problem.

24) **D2 Problem Description** – Detail and define the boundaries of the problem. What, where when and how.

25) **D3 Interim Containment Action(s)** – Describe your containment action(s). This should be a sort of (ASTEMO)AM and your current inventory. There should also be an additional in process check to contain the problem during production.

26) **Verification / Validation** – Define how the Interim Containment Action(s) was verified and validated.

27) **(%) Effective** – Indicate the Interim Containment Action(s) effectiveness.

28) **Date Implemented** – Indicate the implementation date of the Interim Containment Action(s).

29) **D4 Root Causes** – Determine and define the true root cause(s). Be VERY specific.

30) **Verification** – Define method and supply data to verify root cause.

31) **(%) Contribution** – Indicate the percentage of effect for each root cause.

32) **D5 Chosen Permanent Corrective Action(s)** – Define the countermeasure(s) installed to correct the root cause so that there is no longer a possibility of creating this type of defect.

33) **Verification** – Define the process and supply data to show the problem has been fixed.

34) **(%) Effective** – Indicate the effectiveness of the countermeasure.

35) **D6 Implemented Permanent Corrective Action(s)** – Describe what permanent corrective action(s) was implemented.

36) **Validation** – Define how the implemented permanent corrective action(s) was validated.

37) **Date Implemented** – Indicate the implementation date(s) of the permanent corrective action(s).

38) **D7 Preventive Action(s)** – Here you must suggest some type of preventative maintenance to keep this situation and other similar situations from occurring in the future.

39) **Verification / Validation** – Define how the prevent action(s) was verified and validated.

40) **Date Implemented** – Indicate the implementation date(s) of the prevent action(s).

41) **D7 Systemic Prevent Recommendation(s)** – Suggest how systemic problems can be prevented.

42) **Documents that needs Updating –** Indicate the names of all the documents that should

be updated as a result of implementing this corrective action including Process Flow, Control Plan, PFMEA, DFMEA, W work Instructions, Check sheets, Visual Aids etc. All documents mentioned should also be attached to the 8-D clearly identifying the changes made to them.

43) **Date Implemented –** Indicate the implementation date of the Systemic Prevent Recommendation.

44) **D8 Team and Individual Recognition** – Indicate how the individuals and team were recognized.

45) **Reported by** – Indicate who the report was written by, including name, department, title, and phone number.

46) **Contact Number** – Contact number of the person submitting the Supplier 8-D.

NOTE: The initial 8-D as well as subsequent updates and risk analysis, part traceability charts etc. could also be emailed or faxed to the SQA representative as they become available. However, if final 8-D and all the attachments are bulky and could not be emailed then it should be sent via overnight mail.

The completed Final 8-D with all documents mentioned in the root cause analysis and all documents that have been updated as a result of the countermeasure implementation should be attached and sent via overnight mail to the attention of your Supplier Quality Assurance Representative.

SUPPLIER 8D REPORT

SCAR No.	IO No.	HAP-KY Part No.	Supplier Part No.	Part Name	Date Opened	Last Updated On	8D Revision
1	2	3	4	5	6	7	8

RMA No.	Log No.	Number of Part(s)	Returned Part(s)	Suspect Datecode(s)	Supplier Organization Information
9	10	11	12	13	14

Dø Symptom(s):	15		
Dø Emergency Response Action(s):	16	**(%) Effective:**	**Date Implemented:**
Verification/Validation:	17	18	19

D1 Team:	20	**Dept.**	**Phone**	**D2 Problem: Problem Statement:**
Champion:		21	22	23
Team Leader:				
Team Members:				**Problem Description:**
Team Members:				24
Team Members:				

D3 Interim Containment Action(s):	25	**(%) Effective:**	**Date Implemented:**
		27	28
Verification/Validation:	26		

D4 Root Cause(s):	29	**(%) Contribution:**
		31
Verification:	30	

D5 Chosen Permanent Corrective Action(s):	32	**(%) Effective:**
		34
Verification:	33	

D6 Implemented Permanent Corrective Action(s):	35	**Date Implemented:**
		37
Validation:	36	

D7 Preventive Action(s):	38	**Date Implemented:**
		40
Verification/Validation:	39	

All documents mentioned above should be attached. Additional pages should be used for explanations/Diagrams/Pictures etc.

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All suppliers shall verify the Supplier 8-D against the Supplier 8-D Checklist, SQA-Form-012, prior to submittal to ensure that all pertinent questions have been answered. This would improve the quality, content, and clarity of the 8-D being submitted by the supplier. Additional information may still be requested if an item is not fully explained, or contents are unclear.

		YES	NO
ESTABLISH TEAM:	Has team been established?		
	Does the team possess the correct skills mix?		
	Are all necessary areas represented?		
DESCRIBE PROBLEM:	Has location where problem was observed been identified?		
	Has the date the problem was reported been identified?		
	Has failed part or component been identified (including date and lot code)?		
	Has the description of the failure mode been included?		
	Has the customer been notified of the problem, quantity of defects?		
CONTAINMENT ACTIONS:	Has an effective containment action been identified and documented?		
	Have actions been implemented specifically for these concerns?		
	Have dates for temporary containment been identified?		
	Have actions been verified with before and after data?		
	Have detailed instructions on containment been issued?		
ROOT CAUSE:	Has root cause been established?		
	Has root cause been verified?		
	Does the root cause identify what changed and why?		
	Ask why? 5 times		
CORRECTIVE ACTIONS:	Have primary and alternative corrective actions been identified & verified?		
	Do corrective actions address root causes? NOTE: increased inspection/operator error not acceptable.		
	Have possible negative effects of corrective action been considered?		
IMPLEMENT CORRECTIVE ACTIONS:	Have target dates to begin corrective actions been identified?		
	Have corrective actions been proven to eliminate root cause?		
	Have FMEA's, control plans, etc. been updated to document any changes to processes?		
	When will parts be received with countermeasure date?		
PREVENT RECURRENCE:	Have preventative actions been agreed upon by all affected areas & documented?		
	Have preventative actions been completely documented?		
	Do we have plans to implement the preventative action?		
CONGRATULATE TEAM:	Has an appropriate method of recognizing the team effort been selected?		

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A SCAR or 8-D should not be considered closed by a supplier upon submittal of the 8-D unless the (ASTEMO)AM SQA representative specifically informs the supplier of such closure and date of closure.

Controlled Shipping Procedures and Requirements

USAM-USHRP1 has an ongoing program of continuous improvement. Analysis of our past performance and data and experience has shown that of all areas in need of improvement, our supplier PPM is one that is in most need. USAM-USHRP1's internal as well as customer PPM goal is less than 1.5 PPM.

USAM-USHRP1 is very appreciative of the improvements each supplier has made. Our aim is to "continuously" improve the quality of the components that our suppliers and partners send to us. In this effort, the Controlled Shipping program has been developed to aim assistance in our supplier's continuous improvement.

Suppliers whose PPM is above the target and who have re-occurring quality issues could be placed under the SQIP program.

Controlled Shipping may include

CONTROLLED SHIPPING 1 (CS1) where selected parts numbers may be required for a defined quantity or time to have additional 100% sort for defined features by supplier or 3rd party before use by USAM-USHRP1. Results of sort shall be provided to SQE by day or lot.

CONTROLLED SHIPPING 2 (CS2) where selected part numbers may be required to be sorted 100% either at supplier or USAM-USHRP1 by independent 3rd party sort company at supplier's cost. Suppliers must provide plan for exit from CONTROLLED SHIPPING and must receive written approval USAM-USHRP1 SQA for exit**.** Results of sort shall be provided to SQE by day or lot. **Suppliers are required to notify their TS registrar of entry into CS2.**

USAM-USHRP1 SQA will monitor the data supplied by the supplier for each part as requirement is defined. After analysis, USAM-USHRP1 will notify the supplier of ideas on how to improve the processes or on any needed corrective actions.

Process Audit

The Process Audit (SASG N31-01A) is a dynamic tool to help identify areas of concern and to direct efforts at the correct processes to maintain and improve the quality of the parts produced. Suppliers are encouraged to use this tool to identify problem areas and develop appropriate corrective actions to prevent reoccurrence. Suppliers are required to allow USAM-USHRP1 SQA access to production processes to complete this audit.

The Process Audit may be part number specific. This could be used when the supplier's PPM related to the part produced is above the target and/or when numerous quality issues and recurring problems have been associated with a particular part.

USAM-USHRP1's Supplier Quality Assurance representative could ask a supplier to do a self-audit when the need is required. This could also be done during a Supplier Quality Assurance representative's visit to the supplier's facility.

Corrective action plans may be required if the supplier fails to pass the audit. In severe cases of failure, the supplier could be placed under CS1 containment necessitating a 100% inspection of the supplier's product by USAM-USHRP1 or its designated representative. If the supplier does not demonstrate a timely improvement, they could be placed under a restricted list where they would be barred from quoting any new products or materials.

Supplier Audit

The supplier audit N13-02A is used as a tool to evaluate a potential supplier's capability to supply parts to Hitachi Astemo Americas, Inc. This audit will be performed before a potential supplier will be added to the approved supplier list. Supplier shall be at a minimum, third- party registered to IATF 16949 or registered to ISO 9001:2015 with evidence of conformance to IATF 16949

Annual Part Layout Requirements

The supplier has the responsibility to ensure that purchased production parts and material supplied shall be in compliance with all PPAP'ed specifications. Annual recertification is due one year from Initial PSW submission, and every year thereafter. It is the responsibility of the supplier to ensure that these packages are submitted and/or available upon request. A level 4 PPAP with minimum 100% dimensional layout data, (includes 1 part per cavity per multi cavity parts), most recent material certification, and capability data (CPK)