Supplier Quality Manual
CHASSIX Inc.

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Quality Requirements for Supplier Organizations / Suppliers

1.0 INTRODUCTION

The success of CHASSIX is based upon product quality, performance, and economics. The quality of our products depends on **Zero Defect product** purchased from **suppliers and sub-suppliers**.

To assure the highest product quality possible, CHASSIX considers its **Supplier Organizations** as valuable team members in the automotive supply chain.

1.1 CHASSIX QUALITY POLICY

The objectives of our Quality Management System are to:

E – Exceed Customer Expectations for Quality, Delivery and Service
P – Prevent Product Defects through Process Adherence and Focus on Safety Critical Controls
I – Inspire Continuous Improvement
C – Cultivate Employee Job Knowledge and Performance

Through our focus on:

- Customers and Stakeholders
- Team Member Engagement
- Metrics and Priorities Established by Leadership
- Evidence-based Decision Making
- Optimization and Control of Business Processes
- Continuous Improvement and Reassessment

1.2 CHASSIX SUPPLIER QUALITY MANAGEMENT SYSTEM REQUIREMENTS

Minimum quality system requirements for Supplier Organizations to CHASSIX, unless otherwise specified, are:

- Third party registration to **ISO 9001:2015** by an accredited third party certification body
- Conformance or registration (preferred) to the automotive industry standard **ISO/TS 16949:2009 or IATF 16949:2016** latest revision
- Labs for calibration and testing services shall be ISO17025 certified
- Core Tools from AIAG (Automotive Industry Action Group)

Copies of certificates shall be submitted to CHASSIX Purchasing. Acceptance of accreditation(s) shall be communicated to the organization. Should the status of any accepted accreditation change, (i.e. new certification, de-certification, reassessments, etc.) the organization shall notify the CHASSIX Sourcing Team.

1.3 CHASSIX SUPPLIER QUALITY MANUAL

The purpose of this **CHASSIX Supplier Quality Manual** is to serve as a supplement providing additional CHASSIX specific requirements which suppliers and sub-suppliers shall follow.

This supplement, along with automotive industry standards, includes both supplier and CHASSIX responsibilities.

There may be additional (Statutory, Regulatory, OEM or other) customer specific requirements that shall be met based on end user requirements such as Minimum Automotive Quality Management System Requirements for Sub-Tier Suppliers referenced on the iatfglobaloversight.org site.

Material supplied to CHASSIX shall be produced, controlled, inspected, and tested according to the requirements set forth in these documents and other applicable specifications.

The Supplier Organization is responsible to pass down all applicable statutory, regulatory, OEM or other requirements and special product and process characteristics to their suppliers and require the sub-suppliers to cascade all applicable requirements down the supply chain to the point of manufacture.

2.0 DEFINITIONS

When referring to this CHASSIX Supplier Quality Manual and associated automotive industry standards, the following applies.

- The word **'shall'** indicates mandatory requirement.
- The word **'should'** indicates a mandatory requirement with some flexibility allowed in compliance methodology. Organizations choosing other approaches to satisfy a **'should'** shall be able to show that their approach meets the intent of the current **ISO 9001 and IATF 16949(as applicable)**.
- **'Product'** is defined as any part, product, service, etc. supplied to CHASSIX Automotive or its subsidiaries for which this standard is applicable.
- **'Customer'** = CHASSIX
- **'Supplier Organization'** = Supplier to CHASSIX
- **'Sub-Supplier'** = Supplier to CHASSIX Supplier Organizations (sub-suppliers)
- **'CHASSIX Sourcing Team'** = CHASSIX representatives Quality / Supplier Quality, Purchasing / Buyer, Finance, Engineering, etc.

3.0 DOCUMENTATION

3.1 GENERAL

The organization shall maintain and conform to the latest revision level of the required or referenced Purchase Order documentation and any additional product conformance docs.

Specified documentation (such as production records, PPAP records, MSA studies, concern resolution records, control of special characteristics, traceability information, etc.) must be retained at the Supplier Organization, then made available upon request to CHASSIX.

3.2 CHASSIX SPECIFIC DOCUMENTATION

CHASSIX specific documentation may include, but is not limited to the following:

- Purchase Order
- Parts list, Product structure (bill of materials)

- Math model
- Blueprints
- Order specifications
- SOR/SOW
- ES Specification
- PPAP Checklist (CHASSIX-specific for product, bulk material)
- Other supporting specifications/documentation (i.e. DINs, JIS, CHASSIX Matrices, OEM customer, etc.)

3.3 REFERENCE DOCUMENTS

The Supplier Organization shall adhere to the below referenced automotive requirements.

Note: Any organization that supplies product with embedded software has additional requirements in IATF 16949:2016.

The following lists **IATF / ISO / AIAG / ANSI** documents referenced in this standard:

Manual	Published by	Description
ISO/TS16949:2009	IATF	Technical Specification (expires 9/14/18)
IATF 16949:2016	IATF	Automotive QMS Standard (new 10/1/16)
ISO 9001:2008	ISO	Quality Management System Requirements (exp 9/14/18)
ISO 9001:2015	ISO	Quality Management System Requirements (9/15/15)
APQP	AIAG	Advance Product Quality Planning and Control Plan
FMEA	AIAG	Potential Failure Mode and Effects Analysis
MSA	AIAG	Measurement System Analysis
SPC	AIAG	Fundamental SPC
PPAP	AIAG	Production Part Approval Process
ANSI Y 14.5	ANSI	GD&T
AIAG CQIs	AIAG	CQI as applicable per product supplied
MAQMSR	IATF	Minimum Automotive Quality Management System Requirements for Sub-Tier Suppliers Suppliers

Note: Refer to the latest versions

To obtain information of these publications, contact the following websites: www.iatfglobaloversight.org, www.iso.org, www.AIAG.org, www.ansi.org

3.4 CUSTOMER SPECIFIC REQUIREMENTS

The Supplier Organization and associated Sub-Suppliers shall adhere to *applicable* Customer Specific Requirements (CHASSIX/OEM/Industry Standards).

4.0 CHASSIX / SUPPLIER ORGANIZATION INTERFACE

4.1 GENERAL

The Supplier Organization shall communicate through the CHASSIX Buyer during serial production unless otherwise specified. The official business language for all documents shall be English. Other languages may be used with prior CHASSIX approval.

Note: The Supplier Organization shall communicate any management or ownership changes to the CHASSIX Buyer immediately.

Supplier Organization will be required to comply with CHASSIX and OEM customer specific requirements and pass down to sub-suppliers any such requirements as deemed necessary including MMOG/LE, EDI/Web requirements, Capacity verification sheets, APQP, PPAP, change documentation, and warranty requirements.

4.2 COMMUNICATION

Communication is the key to any successful partnership. CHASSIX involves the organization from product concept through mass production.

4.3 PRODUCT VERIFICATION

CHASSIX and its customers shall be afforded the right to verify the Supplier Organization's products, processes and systems at CHASSIX's or organization's locations.

5.0 ADVANCED PRODUCT QUALITY PLANNING (APQP)

5.1 GENERAL

The Supplier Organization shall utilize the planning procedures from the **AIAG Advanced Quality Planning and Control Plan (APQP)** manual. All elements of the **APQP** shall be incorporated into the planning process, unless waived in writing. All documents (including **Process Flow Diagram**, **PFMEA**, **Process Control Plans**) shall include all processes for the manufacturing of components, including incoming inspection, internal transportation, secondary operations, rework, outside services and packaging.

All operations shall be keyed to the Process Flow Diagram, PFMEA and Process Control Plan.

Supplier Organizations are required to evaluate their risk and reactions as documented supplier contingency plans which may include as necessary contingency plans for EDI, transportation, packaging, equipment failure, acts of God, cyber-attacks, supply chain issues, etc.

5.2. PROJECT MANAGEMENT TIMELINE

The organization shall develop a **Project Management Timeline** which contains (at minimum) program events, target dates and assigned responsibilities (refer to **Appendix A: Advanced Product Quality Planning Status Report Form** as an optional form provided from the **AIAG APQP Manual**).

The purpose of the **Project Management Timeline** is to assure the timing of programs as defined by the CHASSIX Sourcing Team.

The **Project Management Timeline** shall be maintained at the organization at all times. Updated copies shall be submitted to the CHASSIX Sourcing Team as required.

The **Project Management Timeline** shall be structured in the following phases:
- Phase I: Design Program Approval
- Phase II: Prototype
- Phase III: SOP (Launch) should include the PPAP process (see section 6.0)

The **Project Management Timeline** should be identified by defining:

- Product part number and/or description
- Organization name
- Originator
- Date and revision level

5.3 APQP FOLLOW-UP

The status of the effectiveness and progress of the program should be followed up and documented after each phase.

As required, a copy of the **Project Management Timeline** shall be submitted to the CHASSIX Buyer and Supplier Quality Representative at requested intervals.

5.4 NON - PRODUCTION TRIAL SAMPLE MATERIAL

Non-production trial samples (i.e. prototype, etc.) shipments shall be identified with the appropriate label and shipped separately from production intent material.

5.5 SPECIAL CHARACTERISTICS

'Special Characteristics' are selected by CHASSIX with the Supplier Organization through knowledge of product and process and identified as ▽, ⍒, ◊, 'SC' and/or customer specific symbols on the drawing, in the specification or other supplemental documentation. The presence of the 'Special Characteristics' is not intended to reduce the importance of other dimensions and/or characteristics selected by the organization. They shall be included on the PFMEA, Process Control Plan and process instructions unless otherwise agreed upon by the CHASSIX Sourcing Team.

5.6 CONTROL OF DESIGNATED CHARACTERISTICS

Items specified as 'Special Characteristics' require manufacturing control to assure compliance. The control data shall be documented and retained at the organization's facility and shall be available for submission and/or review by CHASSIX Supplier Quality or Plant Quality upon request.

5.6.1 Unless otherwise specified, refer to the latest version of the AIAG PPAP manual for capability levels on designated characteristics at time of PPAP and serial production.

5.7 DOCUMENTARY ITEMS

Documentary items refer to symbols used to indicate Safety Critical callouts. A product being considered Safety Critical will result in certain callouts such as dimensions or technical characteristics and will be indentified as any of the following terms: SC/CC, KPC/PQC, Inverted Delta, Diamond feature, or any other method required by CHASSIX customers.

5.8 PRODUCT IDENTIFICATION AND TRACEABILITY

It is expected that the Supplier Organization insure traceability of their product throughout their processes.

Specific traceability and product identification methods will be established at launch. This traceability shall be connected to the bar code serial number of the shipping containers

going to CHASSIX. Every effort shall be made to not mix lot/heat in the shipping containers. In situations where they are mixed, the supplier shall maintain documented traceability that minimizes and clearly identifies the scope of the material traceability, while maintaining robust FIFO practices.

In the case CHASSIX needs traceability information, the Supplier Organization will be expected to supply all pertinent traceability information requested in a very timely manner, typically less than 24 hours or less, dependent on the criticality of the situation (see section 9.3).

Note: The Supplier Organization shall also require their sub-suppliers to have similar traceability requirements.

6.0 PRODUCTION PART APPROVAL PROCESS (PPAP)

6.1 GENERAL

The Supplier Organization shall submit an initial sample report in accordance with the **AIAG PRODUCTION PART APPROVAL PROCESS (PPAP)** manual, including a CHASSIX prescribed PPAP Checklist provided by the CHASSIX Sourcing Team unless otherwise specified (example as Appendix C.)

6.2 SUBMISSION REQUIREMENTS

The organization shall submit specific PPAP requirements in accordance with the latest revision of the **AIAG PPAP Manual** and the CHASSIX PPAP Checklist.

The organization shall submit PPAPs to the level requirements as stated in the latest revision of the **AIAG PPAP Manual** and the CHASSIX PPAP Checklist. The submission level shall use level 3 as the default for all submissions unless specified otherwise by CHASSIX Supplier Quality or Plant Quality.

CHASSIX specific requirements related to the PPAP and documented in the CHASSIX PPAP Checklist include the following:

6.2.1 MATERIAL SAMPLE QUANTITY

Standard sample quantity for dimensional evaluation shall be three (3) products per cavity, (die, progressive die, etc. if applicable) unless otherwise specified.

6.2.2 STATISTICAL DATA

Supporting statistical data (i.e. SPC, process capability studies, etc.) for a PPAP submission should be taken from the PPAP run or from a 'significant material production run'; defined as at least 300 completed products.

6.2.3 MEASUREMENT RESULTS CORRELATION

All samples shall be sequentially numbered and correlated to the dimensional reports. Blueprints should be numbered in accordance with the latest revision of **ANSI Y 14.5** standards. All results shall be taken from master samples and these samples shall be tagged and retained at the Supplier Organization's facility unless otherwise directed. Measurement method agreement, if defined, shall be attached to the organization dimensional evaluation report.

6.2.4 VISUAL DISCONTINUITIES

It is the Supplier Organization's responsibility to attain CHASSIX approval for any visual discontinuities that are not defined on the drawing and not part of good standard manufacturing processes. This approval shall be attained prior to shipping any visually sub-standard parts to CHASSIX. It is expected that the Supplier Organization will attain agreement during the prototype, pre-production and launch phases and be clearly documented in an "evidence book" or similar fashion and signed off by both parties. Any visual discontinuities that are not agreed to prior to receiving will be totally at the discretion of CHASSIX to accept or reject.

6.2.5 CAPACITY VERIFICATION

The capacity for each program is indicated on the RFQ and/or blanket PO. The Supplier Organization shall verify that their process meets or exceeds this capacity and provide written confirmation of the capacity study. Typically, this should be done 8 weeks prior to CHASSIX production unless otherwise agreed to by CHASSIX. The organization will schedule the event and notify Supplier Quality Representative when this event will take place. CHASSIX may elect to participate but this event should not be delayed.

6.2.6 PACKAGING AND LABELING REQUIREMENTS

The organization is responsible to assure that only approved packaging and labelling is used. The organization shall attain an approval through CHASSIX's assigned Program Manager and Packaging Engineer, as well as the receiving plant Representative.

6.2.7 CUSTOMER SPECIFIC REQUIREMENTS:

The Supplier Organization shall submit any applicable **AIAG CQI Assessments** such as CQI-9 heat treat, CQI-11 plating, CQI-12 coating, CQI-15 welding, CQI-17 soldering, CQI-27 casting and CQI-23 molding with the PPAP and repeat annualy prior to their 1 year expiration date. Any assessment nonconformances shall have an action plan and timing to resolve.

The organization shall submit any applicable customer tagging evidence to show compliance with any customer specific tooling tagging requirements with the PPAP.

Note: Before any PPAP submission, deviations from these requirements shall be agreed upon between the organization and the CHASSIX Sourcing Team.

6.3 IDENTIFICATION

All samples accompanying PPAP submissions shall be identified with the appropriate label on the carton or container. The label shall contain all required information and shipped separately from production material.

6.4 FIRST PRODUCTION SHIPMENT AUTHORIZATION

The organization shall ship production intent material to CHASSIX **only** if the **PPAP** submission has been approved in writing by the CHASSIX Supplier Quality Representative and written notification of approval was received by the organization.

Any deviation requests shall be processed and approved using **CHASSIX Supplier Change Management Form PRC-011** (refer to **Appendix B**). See Section 10 for futher information.

Note: The organization shall <u>not ship production intent material without prior PPAP approval</u> by the CHASSIX Supplier Quality Representative.

6.5 ANNUAL DIMENSIONAL LAYOUT

An annual dimensional layout including all sub-components (once per calendar year) of the supplied material shall be performed by the organization unless otherwise specified by the CHASSIX Sourcing Team.

Questions regarding the annual dimensional layout should be directed to the respective CHASSIX Supplier Quality Representative. The results of the annual dimensional layout shall be documented and maintained at the Organization's site and available upon request.

7.0 PROCESS AUDITS

7.1 GENERAL

The CHASSIX Supplier Quality Representative (directed by the Sourcing Team) shall perform audits of the organization's manufacturing process as deemed necessary.

7.2 AUDIT CONDITIONS

Conditions which warrant audits based on risk, may include: Quality/delivery/warranty issues, Engineering changes, Process/material changes, Plant / location changes (e.g. tool transfer) which require a new **PPAP** submission, potential new suppliers, Capacity verification, and Quality Management System certification status.

7.3 AUDIT CRITERIA

The CHASSIX Supplier Quality Representative shall determine the appropriate criteria and communicate this information to the supplier.

8.0 ASSESSMENT OF QUALITY SYSTEMS

8.1 AUTOMOTIVE INDUSTRY QUALITY MANAGEMENT SYSTEM COMPLIANCE

Supplier Organizations need to refer to the latest edition of the automotive industry standard with the goal of supplier conformity with this latest publication (i.e. transition from ISO/TS 16949 to **IATF 16949:2016 compliance by 9/14/2018**) or expiration of their TS cert, whichever comes first.

8.2 QUALITY MANAGEMENT SYSTEM ASSESSMENT

An assessment of the organization's quality management system will be determined by the CHASSIX Sourcing Team. Notification will be given to the organization prior to the assessment.

8.3 QUALITY MANAGEMENT SYSTEM RE-ASSESSMENTS

A re-assessment of the organization's quality management system shall be conducted by the CHASSIX Sourcing Team if deemed necessary (i.e. quality issues, engineering changes, certification, etc.).

9.0 QUALITY DATA SUBMISSIONS

9.1 The Supplier Organization may be required to submit Quality Data (i.e. SPC charts, process monitoring results, material certifications, preventative & predictive maintenance data, etc.) upon request by the CHASSIX Sourcing Team or CHASSIX Plant Quality Represenative. Original documentation shall be retained at the Supplier Organization specifically including evidence of material and product conformance, along with traceability information for life of the program + service, unless otherwise defined by OEM customer specific requirements.

9.2 Upon request all raw material Supplier Organizations' (castings and forgings) shall send material certifications for each shipment/lot of parts to the Quality contact at the CHASSIX receiving plant during serial production. The shipments shall reference the lots (certifications) included with the shipment on the packing slip and traceable to the container bar code serial number.

9.3 The Supplier Organization shall have lot traceability (for all processes and subprocesses) to each shipping container's bar code serial number unless other arrangements have been made with the Quality Manager at the receiving plant (see also section 5.8).

10.0 SPECIFICATION / REQUIREMENT CHANGE / DEVIATION REQUESTS

10.1 GENERAL

The Supplier Organization shall make no changes until CHASSIX approval has been granted. Requests for deviations (temporary or permanent) to specifications or requirements shall be submitted by the Supplier Organization to CHASSIX primary contact(s) for Purchasing/Supplier Quality, Engineering and Plant Quality approval. This request is to be documented on the **CHASSIX Supplier Change Management Form PRC-011** (refer to **Appendix B**). OEM specific change management procedures shall be used when applicable (Ford- SREA, FCA – Forever Requirments, GM – Change Management, etc.)

10.2 DEVIATIONS

Note: Deviated product needs CHASSIX approval prior to shipping.

Deviations are time or quantity limited deviations from specifications. These concessions shall be temporary and are not considered permanent. This request is to be documented on the **CHASSIX Supplier Change Management Form PRC-011** (refer to **Appendix B**).

All deviated parts are to be labeled with a description of the deviation. Prior to shipment, supplier shall notify and receive confirmation to ship from the identified CHASSIX Supplier Quality Representative of the deviated shipment.

10.3 PERMANENT CHANGES

Permanent changes, either Supplier Organization (including sub-suppliers) or CHASSIX initiated, shall be appropriately documented. This request is to be documented on the **CHASSIX Supplier Change Management Form PRC-011** (refer to **Appendix B**). Permanent changes shall require a new **PPAP** submission as specified by the CHASSIX Supplier Quality Representative (if not specified, submissions shall default to the Level 3).

10.3.1 SUPPLIER ORGANIZATION REQUEST FOR ENGINEERING APPROVAL

Supplier Organization initiated change requests shall be communicated and documented on the **CHASSIX Supplier Change Management Form PRC-011**. The Supplier Organization shall make no changes until formal CHASSIX approval has been granted in writing.

10.3.2 CHASSIX INITIATED ENGINEERING CHANGES

CHASSIX initiated engineering changes, including all PPAP requirements, shall be communicated to the Supplier Organization by the CHASSIX Supplier Quality Representative.

10.3.3 GENERAL CHANGE REQUIREMENTS

General changes (i.e. flow charts, control charts, etc.) shall be requested through the applicable CHASSIX Supplier Quality Representative..

Note: No change to material shall be implemented until all proper authorization has been obtained. This includes PPAP submission requirements as specified by the appropriate CHASSIX Supplier Quality Representative.

11.0 NONCONFORMANCE, CORRECTIVE AND PREVENTIVE ACTIONS

11.1 REQUIREMENTS

When CHASSIX has notified the Supplier Organization of a 'nonconformance' issue using a Supplier Concern Notification (SCN), the Supplier Organization is responsible for following a robust and methodical Problem Solving Corrective and Preventive Action Process, using the SCN provided CHASSIX 8D and 3L5W, to ensure there is irreversible corrective action implemented in a timely manner. Corrective Actions shall be submitted to the applicable CHASSIX Supplier Quality Representative (SCN Initiator) using the format provided.

If applicable, any related sub-supplier product concern is to be managed by the Supplier Organization in a similar manner to ensure containment, root cause, corrective action.

11.1.1 INITIAL CONTAINMENT - The Supplier Organization is expected to self-impose Initial Containment as a proactive action taken to mitigate the risk of producing or shipping nonconforming parts or material due to these or other conditions with risk: known product quality issues, out-of-control or incapable processes, production start-up after extended shutdown, significant tool/equipment repair, power outage, new/significant workforce changes, etc.

Initial Containment is required by CHASSIX upon a Supplier Concern Notification as a reactive action taken, then documented on the CHASSIX supplied 8D template.

11.1.2 INITIAL RESPONSE - Both Initial Containment (within 24 hours of a Supplier Concern Notification) and Ongoing Containment actions are required by the Supplier Organization to prevent further shipments of nonconforming parts or material. Containment includes data collection and analysis with information documented on the 8D.

11.1.3 CERTIFIED SHIPMENTS - When Ongoing Containment is required, all product shall quarantined, evaluated to determine product free of defect to clearly identify with "Certified Shipment" labels for the specific defect.

The Supplier Organization shall determine the "book-ends", "break-points", "start-end" traceability information to ensure all suspect product can be contained at the Supplier Organization, CHASSIX, Customer, OEM.

11.1.4 FORMAL CORRECTIVE ACTION - The Supplier Organization shall respond to the Supplier Concern Notification within 24 hours to communicate Initial Containment. This is to acknowledge the SCN communication and prepare for concern resolution through corrective action following the 8D process.

The Supplier Organization shall validate the effectiveness of current process controls and/or inventory quality status per the Supplier Concern Notification. The formal corrective action plan (8D template) is required within 14 calendar days and may require more frequent updates for some concerns.

11.1.5 DOCUMENTATION - A completed 8D is required from the Supplier Organization to be submitted to the SCN Initiator. Follow up may be required upon review until 8D approval and closure.

12.0 SUPPLIER ORGANIZATION QUALITY PERFORMANCE

12.1 GENERAL

12.1.1 It is CHASSIX's expectation that the Supplier Organization shall meet **100% on-time delivery** as defined by CHASSIX logistics. The PPM target for new business shall be determined during the APQP process. The PPM target for current (existing) programs is based on a 10% improvement of actual PPM from the program's best one year performance to drive year over year improvement.

12.1.2 The Supplier Organization's performance shall be assessed by CHASSIX based on criteria outlined in **Appendix D** as a **Supplier Evaluation Report** as ongoing monitoring.

12.2 CRITERIA

Ongoing supplier monitoring may include, not limited to, the following criteria:

- PPM
- Customer Disruptions at the Receiving Plant, including Yard Holds and Stop Shipments
- Delivery
- Incidents of Premium Freight
- Special Status Customer Notifications related to Quality or Delivery Issues (such as CS1, CS2, 3CPR, etc.)
- Warranty, Dealer Returns, Field Actions and Recalls

12.3 PERFORMANCE RESULTS

Results of ongoing supplier monitoring shall be documented by CHASSIX Quality Representatives and communicated to the Supplier Organization monthly using a Supplier Evaluation Report (Scorecard).

12.4 CORRECTIVE ACTIONS FOR PERFORMANCE RESULTS

If a Supplier Organization's performance, based on supplier monitoring, is deemed

unacceptable, a CHASSIX Supplier Quality Representative shall require corrective actions by the Supplier Organization by issuing a Supplier Concern Notification. Corrective actions shall be submitted to and approved by the respective CHASSIX Supplier Quality Representative.

13.0 STATISTICAL TECHNIQUES

The Supplier Organization shall monitor process performance utilizing the appropriate statistical techniques (i.e. First time yield, SPC, etc.) in accordance with the **AIAG Statistical Process Control manual.**

Additional areas in which statistical techniques may be applied are: Predictive maintenance programs, Gage R&R studies, Defect analysis, Continual Improvement Processes.

The results of the statistical techniques shall be documented and retained, then made available upon request by the CHASSIX Supplier Quality Representative.

14.0 ANALYTICAL TECHNIQUES

The Supplier Organization should utilize any analytical techniques helpful to improve process capabilities and problem resolution. Example analytical techniques: Design of Experiments (DOE), Cause and Effect diagram (fishbone), Benchmarking, Shainin (Red X), 3-Legged 5-Why, etc.

The results of analytical techniques should be documented and retained, then made available upon request by the CHASSIX Supplier Quality Representative.

15.0 MEASUREMENT SYSTEM ANALYSIS (MSA)

The Supplier Organization shall perform measurement system analysis in accordance with the **AIAG Measurement System (MSA**) manual. ANOVA is the preferred method of analysis. Other analytical methods and acceptance criteria may be implemented with approval by the CHASSIX Supplier Quality Representative. Results of **MSA** analysis shall be documented and retained, then made available upon request by the CHASSIX Supplier Quality Representative.

16.0 ERROR PROOFING

The Supplier Organization shall utilize error proofing in accordance with automotive industry guidelines specified in IATF 16949 Clause 10.2.4 by utilizing a documented process and detailing the method through a process risk analysis (such as PFMEA) and error proofing test frequencies (red rabbit) documented in the control plan, meeting OEM Customer Specific requirements. Testing of error-proofing devices for failure or simulated failure and associated records shall be documented and retained, then made available upon request by the CHASSIX Supplier Quality Represenative.

17.0 MAINTENANCE

The Supplier Organization shall develop, implement, and maintain a documented total productive maintenance system as outlined in the automotive industry standard IATF 16949 Clause 8.5.1.5. The organization shall document and maintain this program/system and associated records shall be retained at the organization's location, and made available upon request by the CHASSIX Supplier Quality Representative.

18.0 CONTINUAL IMPROVEMENT PROCESS

The Supplier Organization shall have a documented process for continual improvement efforts throughout their entire organization as prescribed in the IATF 16949 standard. Results of the **Continual Improvement Process** shall be documented and retained at the organization's location, and made available upon request by the CHASSIX Sourcing Team.

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19.0 APPENDICES

19.1 APPENDIX A – APQP Status Report from the AIAG APQP Manual

Advanced Product Quality Planning Status Report

Date:	
Review No.:	

Supplier		Program:	
Location		Model Year:	
Supplier Code		Lead Part No:	
Risk Assessment		Part Name:	
New: *Site* ☐ *Technology* ☐ *Process*		Eng. Level:	
Other Risks _____		User Plant(s):	

Team Members	Company/Title	Phone/Fax

APQP Elements	GYR Status	Program Need Date	Supplier Timing Date	Closed Date	Champion Initials	Remarks or Assistance Required
1) Sourcing Decision						
2) Customer Input Requirements						
3) Design FMEA						
4) Design Review(s)						
5) Design Verification Plan						
6) Subcontractor APQP Status						
7) Facilities, Tools and Gages						
8) Prototype Build Control Plan						
9) Prototype Builds						
10) Drawings and Specifications						
11) Team Feasibility Commitment						
12) Manufacturing Process Flow Chart						
13) Process FMEA						
14) Measurement Systems Evaluation						
15) Pre-Launch Control Plan						
16) Operator Process Instructions						
17) Packaging Specifications						
18) Production Control Plan						
19) Production Trial Run						
20) Preliminary Process Capability Study						
21) Production Validation Testing						
22) Production Part Approval (PSW)						
23) PSW Part Delivery at MRD						

COMMENTS

19.2 APPENDIX B - PRC-011 Supplier Change Management Form

Supplier Change Request Form

for Chassix Purchasing / Supplier Quality / Engineering / Plant Approval

Supplier - Basic Information			
Supplier Name:		Program Name:	
Supplier Address:		Part Name:	
		Part Number(s):	

Supplier - Sales Contact		**Supplier - Engineering Contact**	
Name:		Name:	
Phone:		Phone:	
E-Mail:		E-Mail:	
Fax:		Fax:	

Supplier - Description of Requested Change

☐ Temporary ☐ Permanent If Temporary, define duration and/or quantity for traceability purposes

☐ Design ☐ Process ☐ Material ☐ Heat Treat ☐ Supplier ☐ Site ☐ Other

Supplier - Reason for Change

Supplier - Change Implementation Documents

	YES	NO	N/A
DVP&R	☐	☐	☐
DFMEA	☐	☐	☐
PFMEA	☐	☐	☐
Process Flow	☐	☐	☐
Control Plan	☐	☐	☐
Bank / Inventory	☐	☐	☐
Packaging/Labelling	☐	☐	☐

Supplier - Authorized Signature:

Authorized - Name & Title (print): Phone:

Date:

Chassix - Approval / Rejection Section

☐ Approved ☐ Rejected (see comments) ☐ Re-submit (see comments) ☐ Sign-off Complete

Purchasing / Supplier Quality Comments:

Chassix - Authorized Signature: Phone:

Authorized - Name & Title (print): Date:

Engineering Comments:

Chassix - Authorized Signature: Phone:

Authorized - Name & Title (print): Date:

Plant Quality Comments:

Chassix - Authorized Signature: Phone:

Authorized - Name & Title (print): Date:

PRC-011 rev 12/14/17

19.2 APPENDIX C - PRC-012 Supplier PPAP Checklist

Supplier PPAP Checklist

Supplier Name _____ Drawing Change _____

Part No. _____ Date of Change _____

Drawing No. _____ PPAP as one PDF-file: ☑

Part Description _____ Emailed: ☑

Date (MM/DD/YYYY) _____ USB/CD-ROM: ☐

Comments _____

Documents MUST comply with latest AIAG PPAP edition and MUST be in ENGLISH

S = The organization shall submit to the customer and retain a copy of records or documentation items at appropriate locations.
R = The organization shall retain at appropriate locations and make available to the customer upon request.

Select Level: Level 3

Chronology of PPAP documents should match with this checklist

#	Requirement	Comments	Requirement	Submitted
1	Design Record		S	
1(a)	- for proprietary components/details	- incl. drawings, specifcations, material composition, etc. signed by the supplier (latest version)	R	
1(b)	- for all other components/details	- incl. drawings, specifcations, material composition, etc. signed by the supplier (latest version)	S	
2	Engineering Change documents, if any	- authorized engineering change documents, not yet recorded within the design record	S	
3	Customer Engineering Approval, if required		S	
4	Design FMEA	- for suppliers with design responsibility	S	
5	Process Flow Diagram	- including all production process steps and sequences - incl. locations, production lines, machines, test facilities, etc.	S	
6	Process FMEA		S	
7	Control Plan	- including all methods for process control to cover customer requirements - written description of the system for controlling of production parts, bulk material and processes to adress the important characteristics and engineering requirments of the product	S	
8	Measurement System Analysis Studies	- incl. gage R&R for eachcavities - covering all used test equipment	S	
9	Dimensional Results & Annual Revalidation	- incl. all dimensions and requirements (also including e.g. plating thickness) of the design record, control plan and component specific documents (CQR). It should be at least 3 pieces of each cavity. - bill of material with supplier release for sub-supplier and a copy of the PSW of sub-supplier - cross sections - photos of the tools (incl. property information) - see specific dimensional report - any deviation to be marked - all dimensions showing a reference between measurement and drawing - each measured value to be marked with a number in the drawing ("ballooned drawing")	S	
10	Material, Performance Test Results	- incl. chemical, physical or metallurgical requirements - IMDS data system hardcopy with number - incl. functional requirements requested by the component documentation	S	
11	Initial Process Studies	- incl. all special characteristics and any other marked requirement min 50 parts/cavity - cpk and cmk - for each tool and cavity	S	
12	Qualified Laboratory Documentation	- incl. ISIR and reliability lab. accreditation	S	
13	Appearance Approval Report (AAR), if applicable	- esp. including the requirments for aesthetical parts	S	
14	Sample Product		S	
15	Master Sample		R	
16	Checking aids		R	
17	Records of Compliance With Customer-Specific Requirements		S	
18	Part Submission Warrant (PSW)	- seperate PSW for each customer specific part number according to latest revision '- PSW should to be signed by the responsible of the project.	S	
18(a)	Bulk Material Checklist (see 4.1 above)		S	
19	Others:		S	

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19.3 APPENDIX D – Supplier Evaluation Report

<table>
<tr><th>Category</th><th>New Critieria</th><th>New Max Points</th></tr>
<tr><td>PPM</td><td>
<table>
<tr><th colspan="2">General PPM</th></tr>
<tr><td>0-25</td><td>30</td></tr>
<tr><td>26-100</td><td>25</td></tr>
<tr><td>101-200</td><td>20</td></tr>
<tr><td>201-500</td><td>15</td></tr>
<tr><td>501-1000</td><td>10</td></tr>
<tr><td>1001-1500</td><td>5</td></tr>
<tr><td>>1500</td><td>0</td></tr>
</table>
<table>
<tr><th colspan="2">Cast/Forging PPM</th></tr>
<tr><td>0-500</td><td>30</td></tr>
<tr><td>501-1000</td><td>25</td></tr>
<tr><td>1001-2000</td><td>20</td></tr>
<tr><td>2001-3000</td><td>15</td></tr>
<tr><td>3001-4000</td><td>10</td></tr>
<tr><td>4001-5000</td><td>5</td></tr>
<tr><td>>5000</td><td>0</td></tr>
</table>
</td><td>30</td></tr>
<tr><td>Customer Disruptions at the Receiving Plant, including Yard Holds and Stop Shipments</td><td>0 = 20 points
1 or more = 0 points</td><td>20</td></tr>
<tr><td>Delivery</td><td>
<table>
<tr><th colspan="2">On Time Delivery</th></tr>
<tr><td>100%</td><td>20</td></tr>
<tr><td>95-99%</td><td>15</td></tr>
<tr><td>90-94%</td><td>10</td></tr>
<tr><td>85-89%</td><td>5</td></tr>
<tr><td><85%</td><td>0</td></tr>
</table>
</td><td>20</td></tr>
<tr><td>Incidents of Premium Freight</td><td>0 = 10 points
1 or more = 0 points</td><td>10</td></tr>
<tr><td>Special Status Customer Notifications related to Quality or Delivery Issues (such as CS1, CS2, 3CPR, etc.)</td><td>0 = 10 points
1 or more = 0 points</td><td>10</td></tr>
<tr><td>Warranty, Dealer Returns, Field Actions and Recalls</td><td>No issues - target met = 10
warranty over target
with no field actions/recalls = 5
1 or more field actions/recalls = 0</td><td>10</td></tr>
</table>

20.0 REVISION LOG

Revision Date	Revision Detail	Author
9/22/14	Initial Release	Tom Paulan
6/26/17	Updates for IATF Transition, including new supplier change request form and new supplier monitoring criteria	CHASSIX Team, changes made by Elizabeth Maze-Emery
8/2/17	Added reference to embedded software	Elizabeth Maze-Emery / Ben DiCicco
4/6/18	Added additional language to comply with IATF; Added updated forms to Appendix	Elizabeth Maze-Emery / William Westfall