AUTOKINITON

Process Approval Sign-Off (PPAP)

AUTOKINITON

Approval(s): Supplier Quality Manager Jeremy Billerbeck		Standard. No.:	**AGG-ST-052**
		Revision No.:	**2**
		Effective Date:	**10/21/21**
		Page:	**2 of 20**
Subject:	**PROCESS APPROVAL SIGN-OFF (PPAP)**		

TABLE OF CONTENTS

Section	Title	Page
	Introduction / Purpose	3
	Revision / Changes	3
	Definitions	3
1	Risk Assessment	4
2	PAS Elements	4
3	Process Approval	5
4	Process Approval Time-line	8
5	Instructions	9
6	Forms / Data Retention	13
7	Process Approval Checklist	13
8	Tracking	19

AUTOKINITON

Approval(s): Supplier Quality Manager Jeremy Billerbeck	Standard. No.:	**AGG-ST-052**
	Revision No.:	**2**
	Effective Date:	**10/21/21**
	Page:	**3 of 20**
Subject:	**PROCESS APPROVAL SIGN-OFF (PPAP)**	

INTRODUCTION / PURPOSE

Autokiniton Global Group (AUTOKINITON) requires that a Process Approval Sign-off must be performed on all new parts, unless our Customers require a different process (such as Ford's phased PPAP). This process applies to all suppliers (internal and external) of Autokiniton International manufacturing plants in the United States and Mexico.

REVISION / CHANGE(S)

Elements of PPAP revised to align with AIAG and added new elements specific to stampings and welded assemblies.

DEFINITIONS

1.	PPAP	AUTOKINITON Process Approval Sign-off
2.	SOP	Start of Production
3.	SPC	Statistical Process Control
4.	Autokiniton KCF	Autokiniton Key Characteristics Form
5.	PPAP Matrix	Matrix for upcoming PPAP Requirements

Reference Documents

PPAP Matrix	AGG-QUA-FM-026
Supplier Quality Manual	AGG-ST-050
Process Approval Checklist	AGG-QUA-FM-052

AUTOKINITON

Approval(s): Supplier Quality Manager Jeremy Billerbeck	Standard. No.:	**AGG-ST-052**
	Revision No.:	**2**
	Effective Date:	**10/21/21**
	Page:	**4 of 20**
Subject:	**PROCESS APPROVAL SIGN-OFF (PPAP)**	

STANDARD

1. **Risk Assessment**

1.1. There are two levels of part risk assessment:

a. High: Parts must have a AUTOKINITON-led PPAP

b. Low: Parts must have a Supplier-led PPAP

Determinations of part risk will be made by AUTOKINITON Supplier Quality and Program Management, and provided to the Supplier.

2. **PAS Elements**

2.1. There are 29 elements in the AUTOKINITON PPAP, outlined here and explained in greater detail in the “AUTOKINITON PPAP Checklist Requirements” section:

1. Design Record
2. Engineering Change Documents
3. Customer Engineering Approvals, if required
4. Design and Process FMEA
5. Process Flow Diagram and Manufacturing Floor Plan
6. Pre-launch and Production Control Plan
7. Special Product and Process Characteristics
8. Die Simulation Studies (for stampings)
9. Circle Grid Analysis (for stampings)
10. Blue Panel Samples (for stampings)
11. IMDS Compliance
12. Measurement System Analysis Studies
13. Dimensional Results
14. Material, Performance Test Results
15. Initial Process Studies
16. Qualified Laboratory Documentation

17. Appearance Approval Reports, if required
18. Sample Product
19. Master Sample
20. Checking Aids
21. Records of Compliance with Customer Specific Requirements
22. Line Speed Demonstration and Capacity Confirmation
23. Autokiniton Approved Labeling Plan
24. Packaging Instructions
25. Part Submission Warrant
26. Conflict Minerals
27. Restricted Materials (Reach)
28. Reduction of Hazardous Materials (RoHS/RSMS)
29. Safe Launch Data

2.2. In preparing the documentation, if a Supplier believes that a particular element does not apply to the particular part, the element is included with the note “Does Not Apply”. Likewise, if data is applicable to more than one element, it will be displayed in the first applicable element and a note referring to that element in the subsequent applicable elements.

For Production parts, product for PPAP shall be taken from a significant run used to demonstrate line speed (run@rate), unless otherwise specified by the customer.

3. AUTOKINITON PAS/PPAP Process

3.1. The PAS/PPAP process is divided into two paths, depending on the Part Risk Assessment, but results in both cases in a PPAP Package submission, Figure 1. In the AUTOKINITON Led PPAP, an AUTOKINITON colleague will visit at least twice, Figure 2. The first AUTOKINITON visit will review the documentation & plans, and recommend any changes. The second AUTOKINITON visit will witness the parts being made; review the final documentation; evaluate the Initial Process Study; and review the recovery plans, if necessary. In certain cases it

might be necessary for AUTOKINITON to revisit the Supplier in order to conclude the PPAP. In the Supplier-led PPAP, the supplier generates the documentation and maintains it on-file at their facility, Figure 3. After the successful completion of the process, the supplier will submit the PPAP Package (PSW - Part Submission Warrant) to AUTOKINITON Supplier Quality. Supplier will be notified at kick-off meeting if the process is going to be supplier led or AUTOKINITON led, but may change based on the performance or scope change.

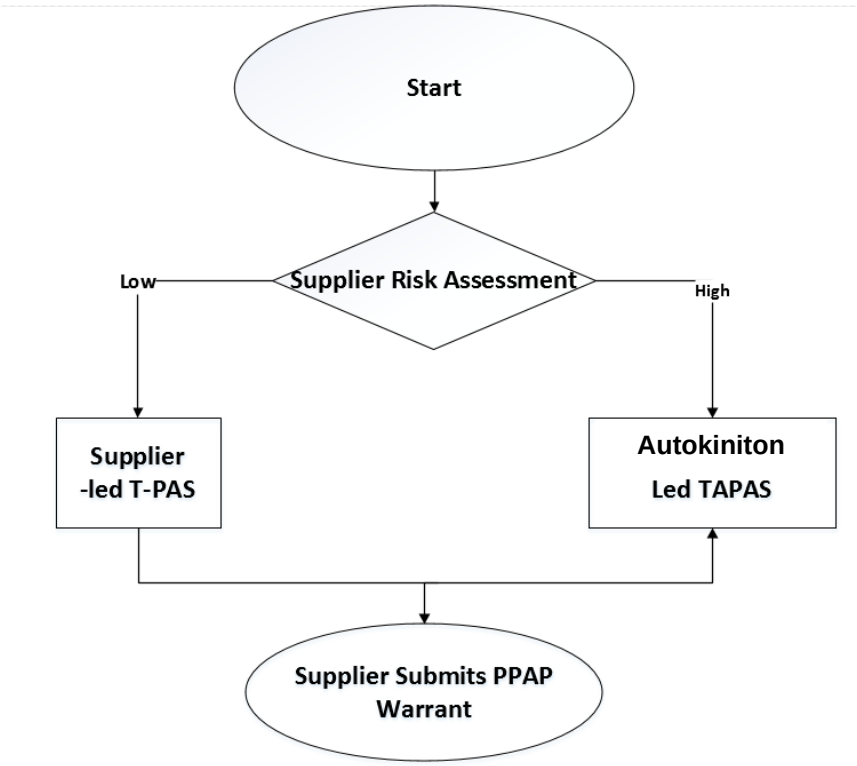

Figure 1. The overall process flow for PAS. Detail for the two major elements follows.

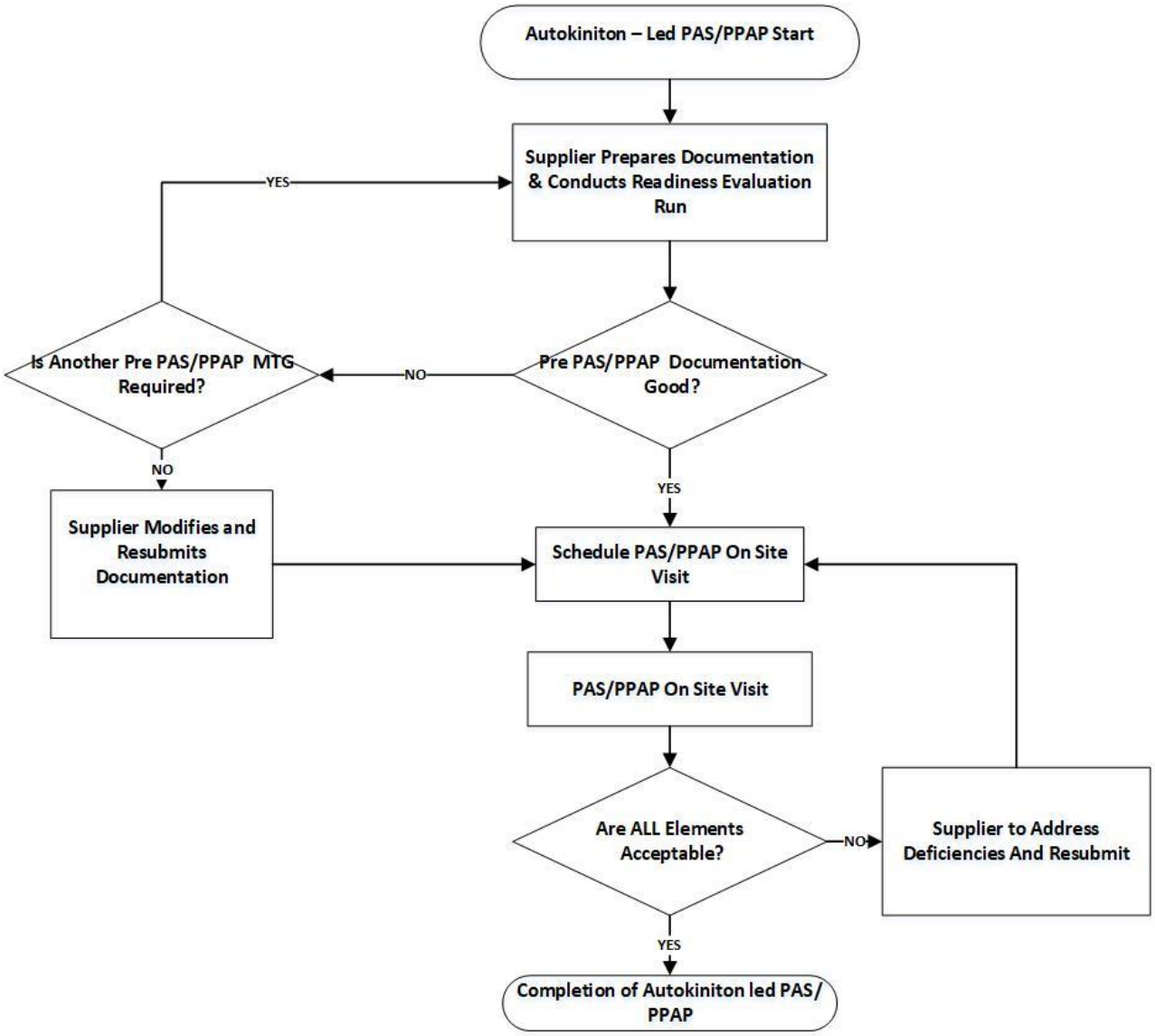

Figure 2. The process flow for Autokiniton-led T-PAS

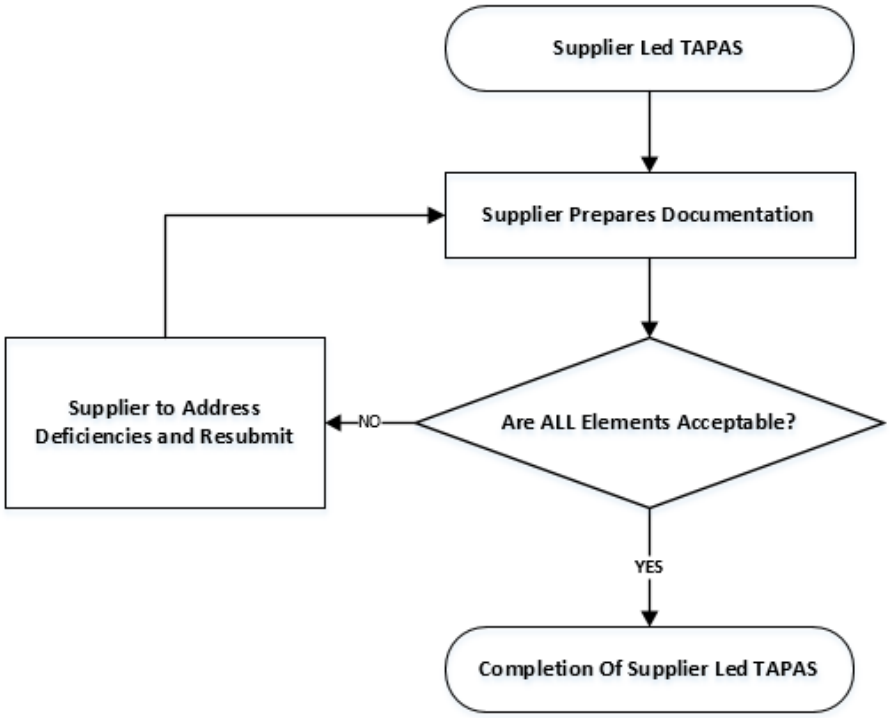

Figure 3. The process flow for Supplier-led T-PAS

4. Process Approval Time-line

4.1. The Process will be completed prior to 16 weeks before the stated Start of Production (SOP – 16 Weeks), Figure 4. If the Supplier cannot finish the elements of the PPAP and complete all visits successfully prior to SOP - 16 Weeks, an Interim Process Approval (Type I) must be sought from AUTOKINITON and must include an approved recovery plan. If at SOP – 8 Weeks the PPAP has not been completed, an additional Interim Process Approval (Type II) must be sought from AUTOKINITON and must include an approved recovery plan. The difference between the Type I & II Interim Process Approvals is the level of approval required from within AUTOKINITON and also from within the Supplier. An Interim Process Approval does not relieve the Supplier of the requirements of completing the PPAP or any liability due to part quality/availability, and it will lead to greater scrutiny of the Supplier by AUTOKINITON. Add 4 weeks to the timeline for overseas suppliers.

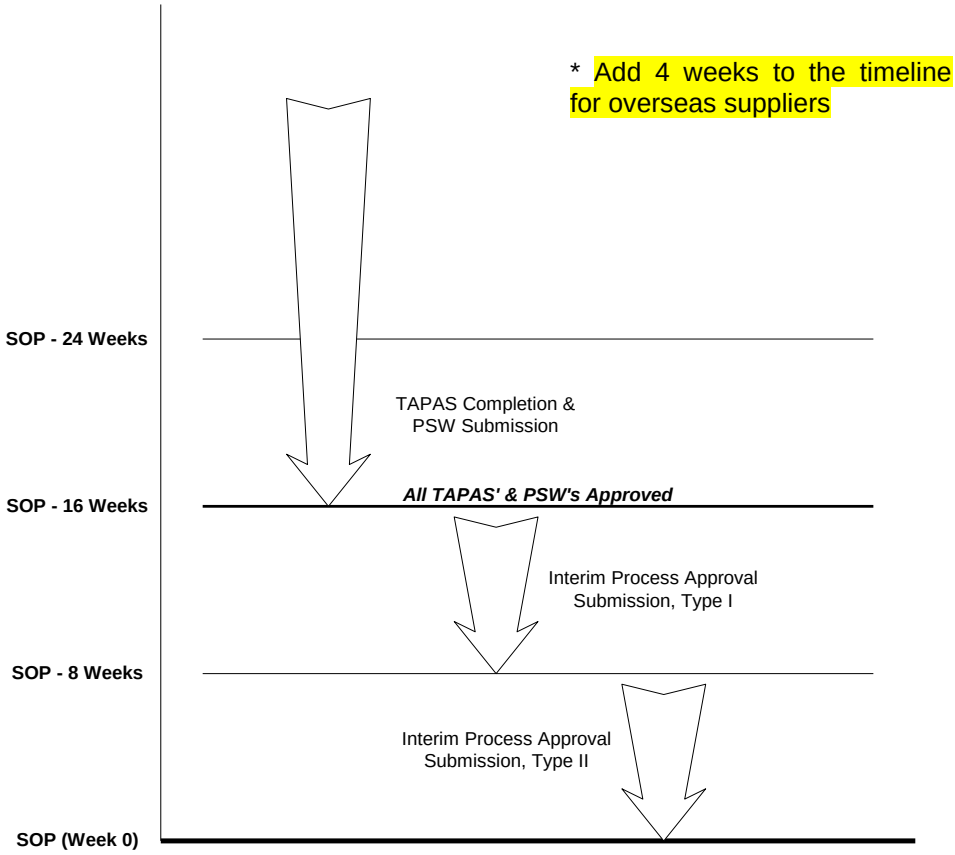

Figure 4. T-PAS completion timeline.

All PPAP and PSW's should be submitted and approved before SOP - 16 Weeks

5. Instructions

5.1. The AUTOKINITON Supplier Quality colleague will initiate the process approval dialogue with the AUTOKINITON Program Team, schedule and coordinate the Approval Process meetings and the On-Site Visits. The AUTOKINITON Supplier Quality colleague will also advise the Supplier of the documentation the team will want to review

5.2. A digital file with all documents would be AUTOKINITON's preferred method of PPAP submission. Please follow the folder structure shown in figure 5. If not, Supplier can supply the package in a binder with dividers that correspond to each Checklist element. Documentation required for each element would be placed in that folder/section. If the element pertains to more than one section, only one copy is required in the folder/binder. Other sections will refer to the

folder/section containing the document copy.

Figure 6. Digital PPAP Folder Structure

5.3. Pre-Process Approval Meeting

5.3.1. Review Program Status

5.3.2. To reduce the time spent at the Supplier's facility, the AUTOKINITON Team must review and approve all PPAP Checklist elements and available documentation with the Supplier prior to the On-Site Visit.

a. It is important that the Supplier Readiness Evaluation Run results for Element 13 & 14 and Product Demonstration Run plans for Elements 22 are reviewed.

b. Element 13 & 14 – the Supplier is required to present the performance results obtained from a (usually 30 pieces) Supplier Readiness Evaluation Run. The Supplier with the concurrence of the AUTOKINITON Supplier Quality colleague will determine the exact quantity. This run shows that the process is set-up, debugged, and ready for the Production Demonstration Run during the Process Approval On-Site Visit.

c. Element 22 – the AUTOKINITON Program Team must review the plan for required production rates, data to be recorded, recording method, measurement method, and calculations to be performed for each station, the overall production line, multiple production lines,

and multiple tools.

d. Element 15 – the AUTOKINITON Program Team must review the Initial Process Study plan for each characteristic and tolerance designated as a “Special” characteristic, as well as those additional characteristics and operations selected by the Team for initial process studies. The Team should review the inspection methods, gauge calibration and R&R results, the data to be recorded, the data recording methods, the quantity to be inspected and the calculations to be performed.

e. These reviews must be completed before the Process Approval On-Site visit is scheduled.

f. Emphasize that this is a team effort to verify production readiness and process capability.

5.3.3. Review all of the elements and requirements from the PPAP Checklist with special emphasis on the following items:

a. Review applicable engineering standards, product material, process methods and inspection procedures, preliminary process performance studies and drawings to confirm test frequencies and procedures to be used in compliance with APQP and Purchase Order requirements.

b. Review Error and Mistake Proofing methods and implementation.

c. Review product and process characteristics and identify the characteristics that will be measured during the Process Approval On-Site Visit. These are not limited to special characteristics such as “MP’s”. The AUTOKINITON Program Team may select any characteristics of interest in addition to special characteristics.

d. Review the Packaging Plan including back-up expendable packaging.

e. Review the Pre-Launch, Safe Launch Requirements and Production Control Plans.

f. Set the Process Approval On-Site Visit date and agenda.

g. Verify the planned line speed for the Process Approval Line speed demonstration build.

h. Discuss the Quoted Lines Speed, Quoted Tooling Capacity, Quoted

Net Operating Time for AUTOKINITON Parts, and rejects with the Supplier and Buyer during the Pre-Process Approval Meeting. The AUTOKINITON Program Team should know the line speed the Supplier will be required to demonstrate before the Process Approval On-Site Visit is scheduled.

5.3.4. Process Approval must be completely approved prior to a full PPAP submission.

5.4. Process Approval On-Site Visit

5.4.1. Begin and end the Process Approval On-Site Visit by meeting with the appropriate plant management personnel to discuss the purpose of the visit and the results of the on-floor assessment. The majority of the time should be spend on the plant floor observing the manufacturing process and reviewing the plant's production readiness.

5.4.2. Verify that all process instructions and Control Plan checks are being effectively implemented.

5.4.3. Review opportunities for Error and Mistake Proofing and process improvement during the on-floor assessment.

5.4.4. Review the process performance studies:

a. Gauge R&R studies must be completed on all measurement systems prior to capability evaluation. Refer to AIAG-MSA guidelines.

b. Pp and Ppk > 1.67 must be achieved for each special characteristic, unless noted.

c. Unacceptable preliminary performance results require a written recovery plan.

5.5. Reinforce to Supplier plant personnel that they cannot change the approved process without prior notification and written approval by AUTOKINITON (DAR process). This includes sub-source changes, and sub-source process changes.

5.6. Each product must have a Safe Launch program. This program should be reviewed again in detail with the Supplier's plant personnel. Following this review, the AUTOKINITON Colleague should indicate that the review took place and enter the appropriate date on the Process Approval Checklist.

5.7. Each Process Approval Sign-off must have a Compliance Report included with the Process Approval Checklist. This is an audit of compliance to specification

requirements and is required for element 13 & 14 of the Process Approval Checklist. The parts and features checked will be determined by the AUTOKINITON colleague during the Process Approval On-Site Visit and may include, but are not limited to, work in progress, piece parts from workstations bins and stock, or final products from the Production Demonstration Run.

5.8. Each Process Approval Sign-off must have Line speed demonstration results included with the Process Approval Checklist. For multiple production lines or multiple tools, a separate form must be included for each one. This form is used to document the quantity of units built during the Production Demonstration Run, the demonstrated line speed, element 22, and the Initial Process Study and First Time Capability results from element 15. End-customer specific forms shall be used to demonstrate line speed and capacity confirmation.

6. Forms / Data Retention

6.1. The AUTOKINITON Process Approval Checklist (Form AGG-QUA-FM-024) shall be used to document the Process Approval Sign-off information. The Supplier must retain all Process Approval information and provide when requested by AUTOKINITON. AUTOKINITON will retain the original copy of the signed-off Process Approval Checklist, Comments/Follow-up Sheet, and Compliance Report and will provide a copy to the Supplier and the AUTOKINITON Program Team.

7. Process Approval Checklist

PROCESS APPROVAL CHECKLIST REQUIREMENTS	
Checklist Element & Instructions	**Documentation**
1) **Design Record** The Supplier shall have the latest design record for saleable product/part, including design records for sub-components. If CAD is available for the part, CAD is master unless otherwise identified and approved by AUTOKINITON.	• Latest revision of CAD or paper drawing • Latest version of the released bill of materials • GD&T, LD, and Weld files
2) **Engineering Change Documents** The Supplier shall have any authorized engineering change documents for those changes not yet recorded in the design record but incorporated in the product, part or tooling.	• Engineering change records
3) **Customer Engineering Approval** Where specified by the customer, the Supplier will have evidence of customer engineering approvals	• Engineering change approval records (eg.).

4) **Design FMEA and Process FMEA** Design and process FMEA's must be completed for each unique product or process and must be approved by the AUTOKINITON Program Team. All FMEA concerns must have descriptions of current controls and recommended actions. The FMEAs are living documents and must be traceable to the engineering change levels and process changes. RPNs on the FMEA shall be reviewed annually at a minimum The PFMEA must reflect the entire manufacturing process from receiving through shipping.	• DFMEA (see Note) • PFMEA
5) **Process Flow Diagram and Manufacturing Floor Plan** The process flow must represent the entire manufacturing process from receiving through shipping and should include the following points: • Process sequence, method, and equipment used at each station including inspection and repair stations • Number of operators needed per station including inspection and repair stations. • It should include both main-line assembly processes and all off-line processes that supply it. The manufacturing floor plan should show the layout of the facility and illustrate station-by-station the overall flow of the manufacturing process.	• Process flow diagram • Manufacturing floor plan
6) **Pre-Launch, Safe Launch & Production Control Plans** Control Plans that cover production before launch and after launch must describe each step of the manufacturing process including: receiving, material handling and storage, in-process operations, testing, inspections, rework/repair, and shipping. A higher degree of inspection, checking, and scrutiny is expected for the Pre-Launch Control Plan than for the Production Control Plan. The Pre-Launch Control Plan will consist of additional controls, inspection audits, and testing to identify non-conformances. Depending on the production process, additional controls shall include: • Off-line, separate and independent checking from the normal production process whenever possible	• Pre-Launch Control Plan • Safe Launch Plan • Production Control Plan

• Mandatory 100% inspection for all pre-production parts shipped • Increased frequency/sample size of receiving, process, and or shipping inspections. • Increased verification of label accuracy The Pre-Launch Control Plan will also serve to validate the Production Control Plan. All process and product control parameters should be documented. Sample sizes, frequency of inspection, acceptance criteria, and reaction plans must be included. The Pre-Launch and Production Control Plans are living documents and must be updated to reflect any changes in the manufacturing process. Any temporary or interim off-standard operation must be identified.	
7) **Special Product and Process Characteristics Identified** Special Characteristics identified on the part drawing (including any SPC points) must be noted on the Control Plan, set-up sheets, and operator instruction sheets**.**	• Special Characteristics list • AUTOKINITON (NA-FM-&$-XXX)
8) **Die Simulation Studies (for stampings)** All stampings shall have final die simulation reports with passing FLD requirements (TI-TC-ST001). Approved production material test results should be used for simulation studies.	• Die Simulation/FLD report (TI-TC-ST001).
9) **Circle Grid Analysis** All stampings shall have circle grid analysis performed on at least one set of homeline produced part(s). The part should be made with production intent steel and should pass Circle Grid Analysis	• Circle grid report or similar
10) Blue panel samples (for stampings) A set of blue panel samples shall be available for review. The samples shall be produced off homeline	• Blue panel samples • Photos of blue panel sample
11) IMDS Compliance All parts shall have customer accepted IMDS numbers. The IMDS numbers shall be generated for raw material to finished good.	• IMDS numbers

12) Measurement System Analysis (MSA) Studies The Supplier shall have applicable MSA studies for all new and modified gages, measurement and test equipment	• Gage R&R reports (ANOVA) • Stability study reports • Correlation study reports • Calibration results
13) Dimensional Results Dimensional verification per the design record and the control plan have been completed and the results indicate compliance with specified requirements. Dimensional data shall be supplied for each unique manufacturing process (eg. Cells, cavities). Note: Min of two pieces data per production stream/cavity required for all dimensional points (eg. LVL2).	• CMM Report • Measurement Report • Road map with all measured points
14) **Material, Performance Test Results** Material test results should be provided for all material used (eg. Steel, aluminum, plastic). All material shall meet specifications defined in the design record and control plan. All parts shall meet all the performance requirements per the specifications defined in the design record (eg. Destruct tests, torque test, pushout tests, corrosion tests, etc)	• Material test results • Weld destruct test results • Torque/pushout test results • Corrosion test results
15) Initial Process Studies Process performance studies (Pp and Ppk) must be performed for all special characteristics and other dimensions selected by the Autokiniton Program Team using part data from the Production Demonstration Run. The selected characteristic, tolerance, type (attribute of variable), quantity processed, quantity accepted, and calculated performance values must be recorded on the Production Demonstration Results form. It is intended that the parts from the Production Validation Run be included in the study. A minimum of 30 pcs, randomly picked, shall be used for the study. Other calculations such as First Time Capability, station process quantities, rates, and accepted quantities must be included in the study and recorded on the Production Demonstration Results form. First Time Capability is measured as the total number of items correctly processed, divided by the total number attempted. These calculations must be completed for each production line/tool. Correctly processed means no repairs are required or allowed. Repaired parts are not to be used in the First Time Capability	• Initial Process Study plan and results • First Time Capability • Station process rates • Reject rates • End item part layout reports

calculation. A recovery plan is required for all items on the Production Demonstration Results form that do not have a Ppk of at least 1.67. **Any deviation from the Ppk requirement must be improved in writing by the AUTOKINITON Program Team and noted on the "Comment/Follow-up Sheet". If Process Capability is less than the required Ppk > 1.67, then 100% verification of shipped parts is acceptable if T-PAS On-Site Visit team agrees**.	
16) **Qualified Laboratory Documentation** Inspection and testing for PPAP shall be performed by a qualified laboratory as defined by customer requirements (accredited lab). When external lab is used, All test results shall be submitted on the lab letterhead or the normal lab report format.	• Laboratory report with details of tests performed, dates and the standards used to perform the test
17) **Appearance Approval Reports** A separate Appearance Approval Report shall be completed for each part if the part has appearance requirements in the design record	
18) **Sample Parts** A minimum of one sample for each cavity/fixture shall be provided. The part shall be from the significant production run	
19) **Master Sample** The Supplier shall retain a master sample for the same period as the production part approval records or a) until a new master sample is produced for the same customer part number for customer approval, b) where a master sample is required by the design record/control plan or inspection criteria, as a reference or standard. Master sample is required for each cavity for multiple cavity process	• Master sample with approval date
20) **Checking Aids** List of all checking aids use to qualify parts shall be provided. The Supplier shall certify that all aspects of the checking aid agree with part dimensional and other requirements.	• List of checking aids • Pictures of the checking aids
21) **Records of Compliance with Customer Specific Requirements** The Supplier shall have records of compliance to all applicable Autokiniton and end-customer specific requirements (Eg. CQI	• CQI compliance • IATF 16949 • LPA

9, 11 12, 15 etc.)	
22) **Line Speed Demonstration and Capacity Confirmation** The Supplier shall demonstrate that they are capable of producing quality parts at the quoted rates. The Production Demonstration Run must be on the production lines, using production tools, processes, and trained operators. The Production Demonstration Run consists of 300 pieces or three hours of production whichever is more stringent. Any deviation from the minimum quantity of 300 pieces or three hours of production must be approved in writing by the AUTOKINITON Program Team and documented on the Production Demonstration Results form. Process constraints which may impact quality or production schedules must be documented on the Comments/Follow-up sheet, and contingency plans established. Supplier shall also demonstrate there is enough capacity available at all steps of the process to consistently meeting. End-customer specific forms shall be used to demonstrate line speed and capacity confirmation.	• Run@Rate forms • Capacity Verifications sheets • CARs
23) AUTOKINITON approved labeling plan Labels must be of standard AIAG format and size (4x6) with the following characteristics: • AUTOKINITON part number and rev level (found on AUTOKINITON release, whether EDI or hard-copy) • Quantity in U/M per container (pieces, lbs, gallons, etc.) • AUTOKINITON purchase order number • AUTOKINITON destination • Unique serial number	• Sample label
24) **Packaging Instructions** Supplier shall have AUTOKINITON approved packaging spec sheet or instructions including approved shipping label	• Unit Load Data Sheets • Packaging Instructions • Labeling Instructions
25) **Part Submission Warrant**	• PSW

Upon completion of all the above requirements, the supplier shall complete the part submission warrant (PSW) A separate PSW shall be completed for each customer part number unless otherwise agreed to by Autokiniton Quality	
26) **Conflict Minerals** Suppliers are required to report conflict minerals tin, tantalum, tungsten, and gold. Autokiniton has partnered with Sandler and Travis Trade Advisory Services to manage our conflict mineral responses. Responses will be handled through STTAS via the general mailbox autokinitonconflictminerals@sttas.com.	• Declaration to STTAS @ autokinitonconflictminerals@sttas.com
27) **REach (Registration, Evaluation, Authoriztion and Restriction of Chemicals.** Suppliers are required to report use of restricted substances and chemicals to us. Restricted substance can be found on restricted substance list published annually.	• Declaration of substances used on REach list.
28) **RoHS/RSMS (Reduction of Hazardous Substances)**	• Declaration of substances used on RoHS/RSMS list.
29) **Safe Launch Data** Results from sorting preproduction and post ppap. Information can be submitted on supplier form or use of Autokiniton Safe Launch Workbook is acceptable. Note all shipped product on safe launch shall be labeled with AGG-QUA-FM-022.	• Copies of Safe Launch Results
	•

8. Tracking

8.1 External Supplier PPAP's will be tracked using the External PPAP Matrix. This is key due to timing requirements of testing and early ppap expectations from Autokiniton OEM's.

8.2 ECN will be entered into the supplier quality matrix by the Supplier Quality Engineer or the Supplier Quality Manager.

8.3 NJA will be entered in the supplier quality matrix by the Supplier Quality Engineer or the Supplier Quality Manager.

8.4 Routing meeting to review matrix and comparison NJA's and ECN's will be conducted by supplier quality team.

8.5 Monthly report for on target, off target, and late will be forwarded to entire team.