



# SUPPLIER PRODUCTION PART APPROVAL PROCESS (PPAP) MANUAL

Revision: 05-23-18 "Property of SL TN America"

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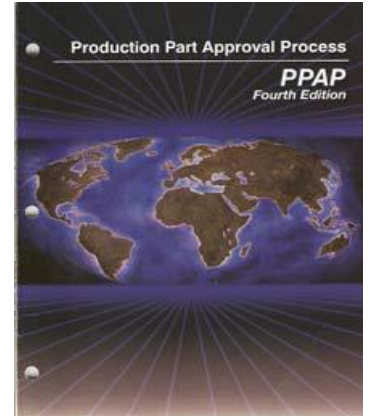
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## REVISION PAGE

Revision Date	Section	Description of Change	Reason for Change
10-15-2013	All	New document. Electronic Approval (ref. DCC Master Dbase)	ICAR 664, 665 & 673 (Ford Q1 Assessment)
11-01-2013	25.0	Added when to us Cpk and Ppk index	ICAR 1128 (Ford Q1 Assessment)
	5.0	Added ref. to Supplier PPAP Form Pack	ICAR 1128 (Ford Q1 Assessment)
	All	New Document. Supplier PPAP Forms Pack	ICAR 1128 (Ford Q1 Assessment)
06-15-2015	11.2	Added Special Characteristic Approval Form (SCAF)	ICAR 1076 (Internal VDA Audit)
	24.0	, Material Testing Form, Performance testing Form	ICAR 1075 (Internal VDA Audit)
	21.0	Update Production Control Plan to include Measuring and monitoring Device and characteristic number requirement.	ICAR 1079 (Internal VDA Audit)
	31.0	Updated checking Aids to identify gages	ICAR 1075 (Internal VDA Audit)
03-15-2016	10.0	Clarification of KPC requirements during annual validation.	ICAR 1570 (GM QSB + Audit)
	11.0	Added D/TLD, SC, CC HC and OS requirements. Clarification of Controls used for KPC and added section 11.4 Special Characteristic Controls	ICAR 1497 (Ford Q1 Assessment). ICAR 1494 (Ford Q1 Assessment)
	19.0	Added examples of processes to be included in the Process Flow	ICAR 1494 (Ford Q1 Assessment)
	20.0	Clarification of PFMEA requirements	ICAR 1579 and 1753 (GM PFMEA Process Audit)
	21.0	Clarification of Control Plan requirements	ICAR 1494 (Ford Q1 Assessment)
	32.3	Clarification of Launch Inspection Requirements	ICAR 1748 (GM Process Audit )
05-15-2016	32.3	Added "Supplier Request to Remove Launch Inspection form" to complete by the supplier.	To required Supplier sign off of requirements. ICAR 1748 (GM Process Audit ) and ICAR 1844 (GM Process Audit)
01-01-17	22.0	Added "The number of distinct categories (ndc) the measurement process can be divided into shall be greater than or equal to 5".	AIAG MSA 4 <sup>th</sup> ed. requirement
		Removed: "A Gage R&R template is included in Supplier PPAP Pack Forms"	Template is Long Gage Study, want to encourage use of ANOVA Method.
		Added: "The preferred method for calculating Gauge R&R is by using the Analysis of Variance (ANOVA) method".	
		Added: "GR&R shall be reported as a percent of tolerance".	Was implied but not specified.
06-20-2017	26.0	Fit/Function KPC's require a Cpk index of 1.67 or greater or a Ppk index of 1.33 or greater	Typo
05-23-2018		Add Printed name field to signature section	Easier to identify hard to read or Chinese/Korean signatures

## 1.0 Foreword

The purpose of this document is to communicate SLTN's requirements with respect to the PPAP process to those companies that supply materials and components to SLTN. These requirements are fully compliant with the **Automotive Industry Action Groups (AIAG) Production Part Approval Process (PPAP)** standard revision 4 March, 2006. SLTN has specific requirements and additions to this standard that need to be fully understood before attempting to successfully submit a PPAP to SLTN for review and approval.



## 2.0 Purpose

The purpose of the **Production Part Approval Process (PPAP)** is:

- To provide the evidence that all SLTN engineering design and specification requirements are properly understood and fulfilled by the Supplier.
- To demonstrate that the Supplier's manufacturing process has the potential to produce product that consistently meets all requirements during an actual production run at the quoted production rate.

## 3.0 When is PPAP Submission Required?

A PPAP is required anytime a new part or a change to an existing part or process is being planned. It is at the discretion of SLTN to determine when and if a PPAP submission will be required. In the event a PPAP submission is not requested, SLTN Supplier Quality reserves the right to request any of these documents at any time during the life of the product. SLTN Supplier Quality reserves the right to request a PPAP submission for a variety of reasons including all of the following:

- New part or product
- New Supplier
- New process or technology
- Changes to existing product
- Change to material or component
  - New, additional or modified tools
  - Upgrade of existing tools
  - Tooling, production, or equipment transferred to a different site
  - Product when tooling has been inactive for 12 months
  - Product or process changes on the components of the product
  - Change in test or inspection method
  - Bulk material: New source of raw material
  - Change in product appearance attributes
  - Change of sub-Supplier or material source

If the Supplier has additional questions concerning the need for a PPAP Submission, they should contact their designated SLTN Supplier Quality Engineer (SQE).

**4.0 Supplier Request for Engineering Approval (SREA) Instructions**

Whenever the Supplier is planning a change that affects a part or the process making that part, it is the Supplier’s responsible to get approval from SLTN prior to initiating that change. To request approval for the change, the Supplier should submit a **Supplier Request for Engineering Approval (SREA)**.

The SREA is used to initiate:

- Permeate print related change
- Temporary deviation from print
- Move of manufacturing to new facility
- Cost saving change
- Change of sub-supplier
- A change of material composition
- Manufacturing process change
- Packaging Change

The form is titled 'Supplier Request for Engineering Approval (SREA)' and includes sections for: Supplier Name and Address, SLTN and Supplier Part Numbers, Reason for Change, Description of Change, Attachments, Effect of Change, and various approval signatures (SQE, Quality Manager, Purchasing) with dates.

The SREA must be approved by SLTN prior to implementation. Failure to have an approved SREA may affect future business opportunities.

SLTN assumes the Supplier will notify SLTN of any planned change(s) a minimum of 90 days prior to planned implementation (Reference. SLTN’s **Supplier Requirements Manual**). The additional requirements section on the form can be used to document any additional testing, performance data or engineering changes that may be required to make the proposed change successful.

**5.0 Elements of a PPAP Submission**

The SLTN PPAP submission requirements are compliant with the existing AIAG standard. One or more of the following elements may be required depending upon the assigned submission level:

1. Part Submission Warrant (PSW)
2. Design Records & Ballooned Drawings
3. Approved Engineering Change Documents
4. Customer Engineering Approval
5. DFMEA
6. Process Flow Diagram
7. PFMEA
8. Control Plan
9. Measurement Systems Analysis (MSA)
10. Dimensional Results
11. Material, Performance Test Results
12. Initial Process Study (Cpk) Capability Studies
13. Qualified Laboratory Documentation
14. Appearance Approval
15. Sample Product Parts
16. Master Sample(s)
17. Checking Aids
18. SLTN - Specific Requirements
  - Tooling Loan Agreement
  - Packaging Form

- Pre-Launch Control Plan
- Launch Inspection Report
- Specification Deviation
- Supplier PPAP Worksheet

Unless otherwise noted, the Supplier should document their PPAP submission using SLTN's **Supplier PPAP Forms (Pack)** or AIAG compliant **Core Tools Forms**. MS Excel templates for **Core Tools Forms** are available from AIAG.

## 6.0 Submission Levels

Submission levels define which elements are required for submission. The levels are used for different reasons and applications. The level to be submitted is determined by SLTN, and unless otherwise noted, always defaults to Level 3 which is a full PPAP submission.

There are five submission levels listed below, and each is typically applied to the specific areas listed.

- **Level 1: Warrant with Appearance Approval Report**

This level applies to 'Non-critical' parts, 'non critical' raw/bulk material or catalog/ commodity parts for electrical applications and re-certification of existing parts previously approved by SLTN at levels 3, 4 or 5. Also used for self-certification.

- **Level 2: Warrant with product samples and limited supporting data**

This level applies to Critical Bulk products such as Plastic/Paint/Chemicals, critical fasteners, simple material changes, simple revision level only changes or simple print updates not affecting form-fit-function. This level can also be applied to low and medium risk parts within a product family

- **Level 3: Warrant with product samples and complete supporting data**

This level applies to new parts on SLTN programs or changes effecting form-fit-function, reliability, or performance. All products resourced to new Suppliers, serial production parts, and existing high risk parts undergoing a part number change (default SLTN Submission Level)

- **Level 4: Warrant and other requirements as defined by the customer**

This level are reserved for special applications only.

- **Level 5: Warrant with product samples & complete supporting data reviewed @ Supplier's location**

**All submissions must be in English.** Immediate rejection will result if not submitted in English.

Changes to existing parts will be handled on a case-by-case basis and submissions other than level 3 require prior approval from SLTN's SQE.

IMDS is required for any PPAP submission (ref. Element 11). The IMDS module must be submitted to, and approved by, SLTN prior to PPAP submission. The IMDS module number and revision level must be recorded on the PSW. Failure to submit an approved IMDS prior to PPAP will delay approval of the PPAP package.

The level required for the Supplier's PPAP submission is determined by SLTN. The Supplier should always verify the submission level required with their SLTN SQE.

If the Supplier has issues with one or more of the PPAP elements they should document those issues on the on the **Part Submission Warrant** (ref. Element 1). All issues must be documented at the time of submission.

## 7.0 PPAP Submission Method

The two methods of submission are:

1. Mailed hard copy in a divided binder (preferred).
2. Emailed copy to the appropriate SL TN SQE.

The Supplier should email a single PDF file consisting of the entire submission.

**Important:** All submissions must be received two weeks prior to the PPAP due date.

## 8.0 Significant Production Run

PPAP data must be generated from random samples of product taken from a 300 piece (minimum) consecutive run. The run should utilize production equipment, tooling, and production employees operating at the designed production rate.

The Supplier shall document the date, time and actual rate of production on the Part Submission Warrant.

## 9.0 PPAP Submission Status

The PPAP submission will be reviewed by SLTN and then either (1) approved, (2) rejected, or (3) given interim status.

1. Approve: formal acceptance of the submission by SLTN.
2. Reject: not accepted/requires resubmission for approval.
3. Interim: permits shipment of material for production for up to 90 days. The Supplier must submit, and SLTN must approve, a **SREA** that clearly documents the Supplier's corrective action plan to achieve full approval within the 90 day period.

## 10.0 Annual Validation

Annual validation is required to be performed by the supplier and be documented in the control plan (See Section 21.0). Results shall be maintained by the supplier and be made available to SL TN upon request. Annual Validation includes but is not limited to the following:

- Current level balloon drawing
- Complete dimensional layout (3 parts per cavity) a minimum of 6 parts total.
- Gage R & R
- Annual testing as required
- Resubmission of PPAP as required.
- Capability study on KPCs identified on the drawing, Control Plan and / or SCAF.

In addition, a complete capability study may be required depending on the supplier performance and / or criticality of the part. Conformance to this requirement is subject to random audit by SL TN.

Suppliers designated as high risk based on VW standard are required to submit annual D/TLD test certification as well as annual VDA audit requirement. Failure to perform this activity results in supplier penalty.

Annual PPAP submissions are not required unless specifically requested by SL TN. Conformance to this requirement is subject to random audit by SL. Suppliers designated as high risk based on VW standard are required to submit annual D/TLD test certification as well as annual VDA audit requirement (reference. **Supplier Requirements Manual**).

## 11.0 Special Characteristics

### 11.1 Key Product Characteristic (KPC) Definitions

All KPC are required to be called out in the Control Plan and proper controls shall be put in place to monitor KPC and documented in the Control Plan. KPC symbols are required to be indented on process control documents, PFMEA, Control Plans, Operator Instructions, Inspection Sheets, etc.

**Fit/Function KPC:** 

A Fit / Function KPC is a product or process characteristic that does not affect safety or regulatory requirements but which, if exceeding specification, could create an unacceptably high warranty condition or significant Customer dissatisfaction and could have a significant impact on the fit or function of the product. Product characteristics with a severity of 8 (ref. Element 5 and Element 7) or those mandated by SLTN are considered Fit/Function KPCs. All Fit/Function KPCs require a Process Capability Analysis, and the Cpk/Ppk index must be 1.33 or greater.

**Safety/Critical KPC:** 

A Safety / Critical KPC is a product, process or testing requirements which, if exceeding specification, could affect safe vehicle operation, compliance with government regulations or statutory requirements. Product characteristics with a severity 9-10 or those mandated by SL TN are considered Safety/Critical KPCs. All Safety/Critical KPCs require a Process Capability Analysis, and the Cpk/Ppk index must be 1.67 or greater.

#### D/TLD

D/TLD is a Volkswagen KPC identifier. A D/TLD is a product characteristic that is equivalent to Safety Critical characteristic. An equivalent KPC symbol for safety critical can be used as long as there is a cross reference back to the D/TLD symbol.

#### Significant Characteristic (SC)

Significant Characteristics are used for Ford components. Significant Characteristics are those products, process or test requirements that are important to customer satisfaction. is a product characteristic and is used for Ford components. It is identified with SC and are those product, process, and test requirements that are important for customer satisfaction

**Critical Characteristic (CC)** 

Critical characteristics are used for Ford components. Critical characteristics are product requirements (dimensions, functional performance requirements, material specifications, etc.) or process parameters (rates, temperatures, pressures, etc.) that can affect compliance with government regulations and/or safe vehicle and/or product function. Critical Characteristics are identified with inverted delta symbol (▼) and require specific manufacturing, assembly, shipping and/or monitoring action.

#### High Impact Characteristic (HC)

High Impact Characteristics are used for Ford components. High Impact Characteristics are process parameters or product characteristics that can adversely affect the operation of the process or subsequent operations if they are outside the specification tolerance” but that do not adversely impact customer satisfaction.



**Operator Safety (OS)**

Operator Safety Characteristics are related to process parameters or product characteristics that may adversely affect the safety of the operator or compliance with government regulations, i.e. Occupational Safety and Health Administration (OSHA) requirements, etc. These characteristics are identified with an OS and their failure modes have been rated a 9 or 10 due to an effect of the process on the process operator. These characteristics are required to be included in a safety sign-off.

**11.2 Special Characteristic Approval Form (SCAF)**

The supplier is required to document all special characteristics on the Special Characteristic Approval Form.

The following characteristics are required to be included on the SCAF:

- Special Characteristic identified on the drawing
- Characteristics that SL TN has identified as critical
- Characteristic that the supplier identifies as critical based off of the PFMEA analysis.

The following information is required to be completed on the SCAF and must be approved by SL TN:

- Special characteristic symbol
- Characteristic Description. The Characteristic description must be detailed and match the description on the Control Plan, PFMEA and Process Flow.
- Specification / Tolerance
- Characteristic number from the Control Plan and PFMEA
- Control Measurement Method. The measuring device and number (if applicable) are required to be documented here and must match the control methods listed in the Control Plan.
- Frequency. The check frequency must match the check frequency on the Control Plan.
- PFMEA – RPN

The SCAF is required to be approved prior to PPAP and the signed copy is required to be submitted with the PPAP Package.

**11.3 Key Control Characteristic Definition**

A Key Control Characteristics (KCC) is a process parameter for which variation must be controlled to some target value to ensure that a KPC(s) is maintained to its nominal value during manufacturing. SLTN may require KCCs for some, or all, KPCs. The Supplier shall initiate SPC data collection, monitoring, and control of all KCCs identified. SLTN's expectation is that the Supplier will address all KPCs in their Control Plan (ref. Element 8). SLTN requires capability studies for all KPCs and any related KCCs.

**11.4 Special Characteristic Controls**

Special controls are control methods that are associated with special characteristics and they are required to be documented in the Control Plan. All control methods selected for Special Characteristics must be demonstrated to prevent shipment of nonconforming product. Where practical, the aim is to control product characteristics through the control of relevant process characteristics. Product characteristic will still be monitored and Control emphasis is on prevention through control of process parameters. Examples include the following:

- Control of a welding process through control of weld current, wire feed rate and weld path (Periodically confirm through a weld section)
- Control of electroplating thickness through bath chemical composition, current and plating time (Periodically confirm through a corrosion test)

All Special Characteristics require to have a capability study performed (Reference Section 26.0 Initial Process Study) at PPAP. Capability is required to be monitored for all characteristics throughout the program. In addition, during the launch of the program, all special characteristics shall be verified 100% during launch inspection (Reference Section 32.3 Launch Inspection Program)

### 1. **Acceptable Controls for Critical Characteristics (CC)**

The control is required to prevent the shipment of nonconforming product to the customer. The following are examples of acceptable Controls for Critical Characteristics.

- Poke Yoke (This is a technique that assures that a part cannot be manufactured or assembled incorrectly)
- 100% Automated Check (End of Line Tester, Torque Screw, etc.)
- First and last piece inspection
- Gaging ( Gaging method may be of the attribute type or variable type)

### 2. **Acceptable Controls for Significant characteristics (SC) and High Impact Characteristics (HC)**

The Control method for Significant and High Impact Characteristics depend on the type of Characteristic it. The 2 types of SC and HC are discrete characteristics and Continuous characteristics.

- **Discrete Characteristics**

Examples of discrete characteristics include but are not limited to:

- Presence
- Absence, orientation
- Material type

Where feasible, these characteristics must be controlled via the use of error-proofing devices that prevent non-conformance. Where error proofing is not feasible, other possible methods that detect non-conformance may be used, such as:

- In-station control
- 100% automatic inspection
- Visual inspection
- Gauging method will typically be of the attribute type.

- **Continuous Characteristics.**

Examples of continuous characteristics include but are not limited to

- Geometric dimensions
- Product functional parameters
- Process parameters

Most continuous characteristics vary over time and should be monitored and controlled using Statistical Process Control (SPC) to achieve a state of statistical control and allow for effective and timely identification of out of control conditions. Sampling frequency shall be based upon process capability. Gauging method will typically be of the variable type.

If attribute gauging is used guard banding should be considered. Guard banding is a reduction in gauge acceptance criteria to make the acceptance criteria tighter than the engineering specification.

For continuous characteristics related to process parameters, automated control is acceptable, where proven to be effective.

**12.0 PPAP Training**

SLTN will offer Supplier PPAP training at several levels. The Supplier should contact their designate SLTN SQE for more information. Suppliers can also refer to the AIAG website ([www.aiag.org](http://www.aiag.org)) for additional information, training and materials on the PPAP standard 4th edition as well many of the various elements within the standard.

**13.0 Instructions for completing a PPAP Submission**

All submissions must be received two weeks prior to the PPAP due date. The review and approval process will be facilitated by the applicable SL TN SQE.

**14.0 Part Submission Warrant (PSW)**

The purpose of the **Part Submission Warrant** (PSW) is to document the submission prior to production. A PSW is required regardless of submission level.

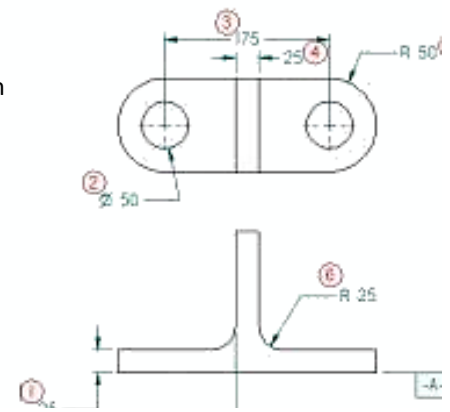
The Part Submission Warrant is included in the **Supplier PPAP Forms Pack**. It must be filled out and signed by the Supplier. The part number must match the part number on the **Purchase Order** provided by SLTN Purchasing.

The **PSW** must be submitted with correct part number, revision and submission level. All fields must be completed. Fields that do not apply to the Supplier’s submission should be answered with ‘N/A’ (Not Applicable).

**15.0 Design Records**

The purpose of Design Records is to provide a copy of the formal part print and to document any additional engineering records for reference. Every characteristic on the drawing must be “ballooned” to correspond with the inspection results (see Element 10). Engineering Records should also include any functional / material / test specifications that SLTN requires (see Element 11).

A **Ballooned Drawing** shows the parts or assemblies in a part print with a numbered “balloon” that point to individual dimensions and/or requirements. The numbers on the ballooned drawing should correlate with the **Item #** found on the **Dimensional Data Sheet**. A ballooned drawing must be submitted as part of PPAP for every submission level when there are dimensional results.



**An example of a Dimensional Data Sheet with Item Number.**

ITEM #	Required Cpk (Y/N)	Data Type: V=Variable A=Attribute	REQUIREMENT: Description of Check	Measurement Method	Target	Bonus Applied (Y/N)	Min	Max	Data for Sample Number.....										
									1	2	3	4	5	6	7	8	9	10	
1	N		Hole to Hole	CMM	4.5	N	4.490	4.510	4.495	4.500	4.500	4.490	4.490						
2	N		Radius	Radius Gauge	0.75	N	0.735	0.765	0.745	0.743	0.730	0.752	0.752						
3	N		Hole to Hole	CMM	0.275	N	0.271	0.274	0.270	0.273	0.274	0.273	0.273						

Every dimension and/or requirement must be ballooned and numbered for reference and measurement, including:

- Dimensions and tolerances of parts
- Electrical requirements (performance data, functional tests, etc.)
- Visual features (color, texture, etc.)
- Material characteristics (cure time, etc.)
- Physical and mechanical properties (tensile strength, plating thickness, heat-treat hardness, etc.)
- Any other specified requirement that the Supplier has the capability to measure or that is described in print notes or referenced specifications

When dimensions are specified at multiple locations on the drawing, the data for each location should be numbered separately.

### 16.0 Approved Engineering Change Documentation

This Element is used to document items not addressed in a part print such as emails, SREAs, and Feasibility Studies.

- **SL Engineering Change Notice** (ECNs) must be approved, not pending.
- Print change submissions must have current prints.
- Emails can only clarify requirements, not define them
- Emails cannot re-define a requirement in lieu of a print change.
- All Supplier - requested changes must be documented via a **SREA**.

The **SREA** must be approved by SLTN prior to making the proposed change(s).

### 17.0 Customer Engineering Approvals

Customer Engineering Approvals are used to demonstrate pre-approval of a design by SLTN's Customer. Customer Engineering Approvals are not required for Supplier submissions.

### 18.0 Design FMEA (DFMEA)

**Design Failure Mode and Effects Analysis** (DFMEAs) provide evidence to SLTN that potential failure modes and their associated risks have been addressed through product design changes and improvements. A DFMEA is only required when the part is designed by the Supplier.

The date on the DFMEA should show release prior to print release. Severity, Occurrence and Detection ratings must be compliant with the AIAG guidelines for FMEA (4<sup>th</sup> edition).

Any potential failure mode with a severity ranking of 8, 9 or 10 must be addressed with a corrective action plan. Furthermore, potential failure items in the top 25 percent RPN ranking should have corrective action items addressing their potential failure mode.

### 19.0 Process Flow Diagrams

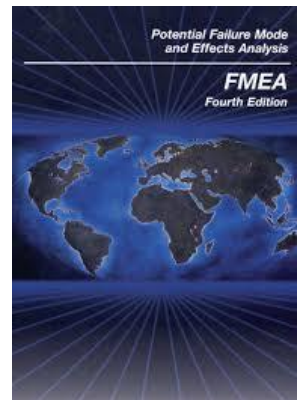
The purpose of a **Process Flow Diagram** is to document the sequence of events required to manufacture the part and links the individual process steps to a manufacturing system.

The process steps must match both the **Control Plan** and the **PFMEA**. Process flows must include the entire manufacturing process (receiving through shipping) and include all key steps in the process and all offline activities which includes but is not limited to:

- Measurement
- Inspections
- Storage
- Part Movement
- Shipping
- Quality Audits
- Scrap parts
- Rework parts
- Launch Inspection
- Tool changes
- Alternative Processes
- Part Buffers
- Part Identification and Handling
- Process Set up
- Changeover
- Nonconforming parts
- Outsourced processes
- Receiving

Each process step should include the identification of product or process characteristics and these should match the characteristics called out on the Control Plan. Each Characteristic with in each process step shall be assigned an unique characteristic number. The Process Flow Diagram should also include Machine Names, Machine Numbers, tools for Manufacturing, identification of special characteristics and characteristic target and tolerances.

The Process Flow Diagram template is included in the Supplier PPAP Pack Forms



## 20.0 Process FMEA (PFMEA)

The **Process Failure Mode and Effects Analysis** (PFMEA) provide evidence to SLTN that potential failure modes and their associated risks have been addressed through prevention of controls at the manufacturing process level.

A PFMEA should be performed for every part, piece of equipment or process involved in manufacturing. Severity, occurrence and detection ranking values should be developed in alignment with AIAG's **FMEA Manual** 4<sup>th</sup> Ed.

FMEA is a cross-functional activity that can lead to inconsistency if team members are not properly trained. It is highly recommended that the supplier purchase a copy of the AIAG's **FMEA Manual** 4<sup>th</sup> Ed. In addition, AIAG also offers additional training that the Supplier can attend. SLTN's SQE can also assist with any questions concerning FMEA.

A minimum of one (1) failure mode shall be identified for each characteristic called out on the Control Plan. The unique Characteristic number shall be included on the PFMEA and shall match the Process Flow Diagram, Control Plan and SCAFF.

The supplier shall have a documented risk reduction process in place and corrective action plans shall be documented in the PFMEA. In addition, All Supplier Corrective Actions (SCAR) issued from SL TN shall be included in the PFMEA action plan and the SCAR number shall be included in the entry.

The Process PFMEA template is included in the Supplier PPAP Pack Forms

### 20.1 Severity Rankings

Severity is the rank associated with the most serious effect from the Potential Effect(s) of the failure. A reduction in a Severity ranking can be effected through a design change to a system, sub-system, component or a design of the process. SL TN requires that any severity ranking of 8, 9 or 10 be addressed with a corrective action plan.

The following shall be used when assigning a Severity Ranking:

Severity of Effect on Product (Customer Effect)	Severity Ranking	Severity of Effect on Process (Manufacturing / Assembly Effect)
Potential failure modes affects safe vehicle operation and / or involve noncompliance with government regulation <b>without warning</b>	10	May Endanger operator (machine or assembly) <b>without warning</b> .
Potential failure modes affects safe vehicle operation and / or involve noncompliance with government regulation <b>with warning</b> .	9	May endanger operator (machine or assembly) <b>with warning</b> .
Loss of primary function (vehicle inoperable, does not affect safe vehicle operation)	8	100% of product may have to be scrapped. Line shutdown or stop ship.
Degradation of primary function (vehicle operable but at reduced level of performance)	7	A portion of production run may have to be scrapped. Deviation from primary process including decreased line speed and added manpower.
Loss of secondary function (vehicle operable but comfort / convenience function inoperable.)	6	100% of production run may have to be reworked off line and accepted
Degradation of secondary function (vehicle operable, but comfort / convenience function at reduced level of performance)	5	A portion of the production run may have to be reworked and accepted.
Appearance or Audible Noise, vehicle operable, item does not conform and noticed by most customers (> 75%)	4	100% of production run may have to be reworked in station before it is processed.
Appearance or Audible Noise, vehicle operable, item does not conform and noticed by most many customers (50%)	3	A portion of the production run may be reworked in-station before it is processed.
Appearance or Audible Noise, vehicle operable, item does not conform and noticed by discriminating customers (<25%)	2	Slight inconvenience to processes, operation or operator
No discernible effect	1	No discernible effect

**AIAG Potential Mode and Effect Analysis (PFMEA) Fourth Edition: Severity Evaluation Criteria**

**20.2 Occurrence Rankings**

Occurrence is the likelihood that a specific failure cause / mechanism will occur. The supplier should agree on evaluation criteria and a ranking system and apply it consistently. A reduction in the occurrence ranking can be effected by removing or controlling 1 or more of the causes or mechanisms of the failure mode through a design revision.

The following shall be used when assigning an Occurrence Ranking:

Potential of Failure	Occurrence Ranking	Likely Failure Rate
Verify High: Persistent failures	10	≥ 100 per 1,000 pieces (≥ 1 in 10)
	9	50 per 1,000 pieces (1 in 20)
High: Frequency failures	8	20 pieces per 1,000 pieces (1 in 50)
	7	10 pieces per 1,000 pieces (1 in 100)
Moderate: Occasional Failures	6	5 pieces per 1,000 pieces (1 in 500)
	5	2 pieces per 1,000 pieces (1 in 2,000)
	4	1 piece per 1,000 pieces (1 in 10,000)
Low: Relative few failures	3	0.1 per 1,000 pieces (1 in 100,000)
	2	≤0.001 per 1,000 pieces (1 in 1,000,000)
Remote: Failure is unlikely	1	Failure is eliminated through preventive controls.

Potential of Failure	Occurrence Ranking	Likely Failure Rate
AIAG Potential Mode and Effect Analysis (PFMEA) Fourth Edition: Occurrence Evaluation Criteria		

**20.3 Detection Rankings**

The Detection ranking is associated with the best detection control listed for that characteristic. In order to achieve a lower ranking, the planned detection controls have to be improved. When more than one control is identified, it is recommended that the detection ranking of each control be included as part of the description of the control. Random quality checks are unlikely to detect the existence of an isolated problem and should not influence the detection ranking.

The following shall be used when assigning a Detection Ranking:

Opportunity for Detection	Criteria Likelihood of Detection by Process Controls	Detection Ranking	Likelihood of Detection
No detection opportunity	No current process control; Cannot detect or is no analyzed	10	Almost Impossible
Not likely to detect at any stage	Failure Mode and/or Error (cause) is not easily detection (e.g. random audits)	9	Very Remote
Problem Detection Post Processing	Failure Mode detection post processing by operator through visual / tactile / audible means	8	Remote
Problem Detection at Source	Failure Mode detection in-station by operator through visual / tactile / audible means or post-processing though use of attribute gaging (Go / No Go, manual torque check, clicker wrench, etc.)	7	Very Low
Problem Detection Post Processing	Failure Mode detection post processing by operator through variable gaging or in-station by operator through use of attribute gaging (Go / No Go, manual torque check, clicker wrench, etc.)	6	Low
Problem Detection at Source	Failure Mode or Error (Case) detection in-station by operator though use of variable gaging or by automated controls in-station that will detect discrepant part and notify operator (light, buzzer, etc.) Gaging performed on setup and first-piece check (for set-up causes only).	5	Moderate
Problem Detection Post Processing	Failure Mode detection post-processing by automated controls that will detect discrepant part and automatically lock part in station to prevent further processing.	4	Moderately High
Problem Detection At Source	Failure Mode detection in-station by automated controls that will detect discrepant part and automatically lock part in station to prevent further processing.	3	High
Error Detection and / or Problem Prevention	Error (Cause) detection in-station by automated controls that will detect error and prevent discrepant part from being made.	2	Very High
Detection no applicable; Error Prevention	Error (Cause) prevention as a result of fixture design, machine design or part design. Discrepant parts cannot be made because item has been error-proofed by process / product design.	1	Almost Certain
AIAG Potential Mode and Effect Analysis (PFMEA) Fourth Edition: Detection Evaluation Criteria			

**21.0 Production Control Plan**

A **Production Control Plan** is a documented summary of the steps needed to control a process and the variations in a process within the acceptable limits. It describes actions required to maintain the ‘desired state’ of the process and minimize process and product variation. A Control Plan provides a single point of reference for understanding process characteristics, specifications, and standard operation procedures.

Specifically, a Control Plan is required to address the following:

- Identification of KPC characteristics
- Identification of KPC characteristics controls
- Identification of any measuring and monitoring devices. If the device is identify by a specific number (i.e. gage number, etc.) the gage number is required to be included on the Control Plan.
- Secondary/outsourced operations
- Materials and their properties
- Process equipment at each operation
- Test equipment used to measure each characteristic
- Specifications, sampling strategy, control and reaction methods used
- Periodic conformance testing and product verification

The Control Plan must clearly state each step in the process and the applicable specification or standard. It should describe the function of the process in terms that can be measured. Measurable include all end product and in-process requirements. These requirements must be verified or validated and include additional constraints or design parameters such

- Reliability and serviceability specifications,
- Special conditions
- Weight
- Size
- Location
- Accessibility
- Part characteristics being created or modified including position, depth, diameter and hardness.

08/02/12	Problem	No. Length	F. Production	P. System/Process	Job #/Job	Control Plan	Date
08/02/12	Problem	No. Length	F. Production	P. System/Process	Job #/Job	Control Plan	Date
08/02/12	001	100	10	10	10	10	10
08/02/12	002	100	10	10	10	10	10
08/02/12	003	100	10	10	10	10	10
08/02/12	004	100	10	10	10	10	10
08/02/12	005	100	10	10	10	10	10
08/02/12	006	100	10	10	10	10	10
08/02/12	007	100	10	10	10	10	10
08/02/12	008	100	10	10	10	10	10
08/02/12	009	100	10	10	10	10	10
08/02/12	010	100	10	10	10	10	10
08/02/12	011	100	10	10	10	10	10
08/02/12	012	100	10	10	10	10	10
08/02/12	013	100	10	10	10	10	10
08/02/12	014	100	10	10	10	10	10
08/02/12	015	100	10	10	10	10	10
08/02/12	016	100	10	10	10	10	10
08/02/12	017	100	10	10	10	10	10
08/02/12	018	100	10	10	10	10	10
08/02/12	019	100	10	10	10	10	10
08/02/12	020	100	10	10	10	10	10

The Supplier should document, in sequence, all materials and processes involved in the manufacturing process. The process flow diagram and ballooned drawing provide inputs to the Control Plan. All KPCs & any related KCCs must be listed in the Control Plan. Each characteristic must have a unique characteristic number. This number must also be carried over to the Process Flow Diagram, PFMEA and SCAF.

All testing requirements, inspection and measurement that are required to make a quality product are required to be addressed within the Control Plan. Every step in the process requiring disposition is required to have a defined “Control Method” and “Reaction Plan” outlined on the Control Plan.

The designated frequency called out in the Control Plan shall match the frequency called out on the SCAF. In addition the frequency must be in specific terms, i.e. 2 parts per cavity every 2 hours or 10 parts per shipment. Referencing a document for a designated frequency is not acceptable, the quantity of parts and frequency of the check must be called out.



The Supplier's team that creates the control plan should include the process owner and representation from all areas involved in the process. After submission, as the process changes and the control methods are improved, the plan should be continually updated. Updates due to corrective actions should be noted in the Control Plan and the corrective action number should be included.

The Control Plan template is included in the Supplier PPAP Pack Forms

## 22.0 Measurement System Analysis Studies (MSA)

**Measurement system analysis (MSA)** is a method of determining how much the variation within the measurement process contributes to overall process variability. MSA is used to ensure the use of a valid and reliable measurement system. Detail on MSA is found in the AIAG manual which defines guidelines for stability, bias, linearity, repeatability and reproducibility. Applicable Measurement System Analysis studies are required for all new or modified gages, measurement and test equipment.

A **Gage Repeatability and Reproducibility Study (GR&R)** is used to ensure that measurements used in the manufacturing process are reasonably consistent regardless of how many times they are performed, or by who they are performed by.

SLTN requires a GR&R analysis of all measurement systems identified in the Control Plan. The minimum requirements for SLTN Suppliers are:

- GR&R shall be reported as a percent of tolerance
- % GR&R should be at 15% or less for KPCs/KCCs
- Marginal gages (between 15% and 30%) need an action plan to address and improve the method of measurement. This action plan shall be included in the PPAP Submission and must include planned target date of completion.
- Gages with R&R above 30% cannot be used
- The number of distinct categories (ndc) that the measurement process can be divided into shall be greater than or equal to 5

There are several many methods for performing and evaluating a GR&R. The Supplier can use any method / format / software as long as it is compatible with the practices prescribed by AIAG. The preferred method for calculating Gauge R&R is by using the Analysis of Variance (ANOVA) method.

The organization shall report gauge R&R as both a percent of study variation and a percent of tolerance.

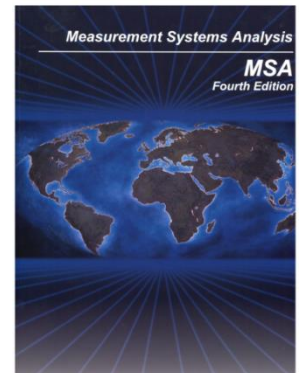
## 23.0 Dimensional Results

Dimensional results should be documented on the **Dimensional Data Sheet** form. The measurements on this form should correlate with the Supplier's balloon drawing from Element 2.

The purpose of this element is to show conformance to the SLTN part print on dimensions and all other requirements. Non-dimensional requirements should be addressed in the Material and Performance section of the PPAP submission. SLTN requires a full dimensional layout of the part on all PPAP submissions except level 1.

The dimensional report must address all of the following:

- All dimensions
- All applicable notes that have variable dimensions (example: tensile test)
- Any dimensions contained on reference prints



- Tolerances that include bonus points for Geometric Dimensioning & Tolerance (GDT) callouts.

**Important:** The sample parts measured for Element 10 should be the same parts submitted as samples in Section 23.

All dimensional requirements on the ballooned drawing must be listed on the **Dimensional Data Sheet** form. If multiple pages are required to complete a full inspection, all copies of the **Dimensional Data Sheet** form must include completed headers. When requirements are referenced at multiple locations on the print the data must be recorded for each individual location. All callouts and notes must be included.

**Example of Dimensional Data Sheet**

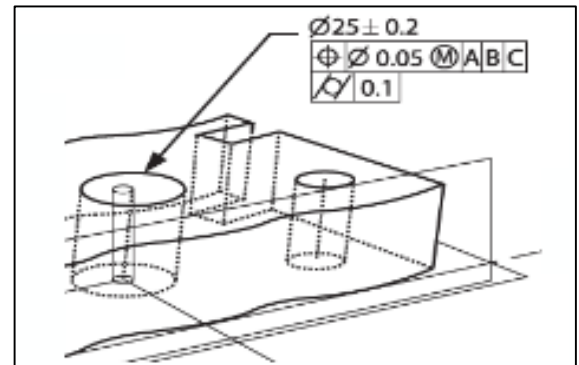
ITEM #	Required Cpk (Y/N)	Data Type: V=Variable A=Attribute	REQUIREMENT: Description of Check	Measurement Method	REQUIREMENT: Target	Bonus Applied (Y/N)	Min	Max	Data for Sample Number.....					Average	Range
									1	2	3	4	5		
1	N		Hole to Hole	CMM	4.5	N	4.490	4.510	4.495	4.500	4.500	4.490	4.490	<b>4.50</b>	0.01
2	N		Radius	Radius Gauge	0.75	N	0.735	0.765	0.745	0.743	0.730	0.752	0.752	<b>0.74</b>	0.02
3	N		Hole to Hole	CMM	0.275	N	0.271	0.274	0.270	0.273	0.274	0.273	0.273	<b>0.27</b>	0.00

All sections of the **Dimensional Data Sheet** form must be filled out completely. The Measurement Method must be documented for every line item set of data. In addition, on GD&T tolerances, the specification and any bonus tolerance must be added to the minimum and maximum tolerances.

**Example:**

This call out would require 3 lines of separate data on the dimensional report.

1. Hole diameter ( $.25 \pm 0.2$ )
2. True Hole Position (0.05 MMC on Datum A,B,C)
3. Cylindricity (0.1)



Any out of specification conditions should be brought to the attention of SLTN’s Supplier SQE **before** submitting the PPAP submission. Depending on the circumstances, a temporary deviation can be requested by the Supplier via a **Specification Deviation** (Reference: *Section 31.0 SLTN Specific Requirements*).

A Dimensional Data Sheet template is included in the Supplier PPAP Pack Forms

**23.1 Single Cavity Mold**

The Supplier is required to measure a minimum of 3 parts. These must be the same 3 parts that are submitted as Samples in Section 23. All 3 parts should be identified with the corresponding number on the part or the tag.

**23.2 Multiple Cavity Molds:**

The minimum number of parts to measure for the dimensional element is 1 part from each cavity. A minimum of 1 part from each cavity should be submitted as Samples in Section 23 and these must be the same parts measured for dimensional data. All parts should be identified with the corresponding number on the part or the tag.

**24.0 Material and Performance Test Results**

**Material/Performance Test Results** is a general category for all test/measurement results other than dimensional. Any AIAG compliant forms may be used for test results. The Supplier must document that the material is confirmed and acceptable performance is demonstrated.

#### 24.1 Material Test Results

Material Test Results should be provided in the form of a material composition report typically called a **Certificate of Analysis** (COA) from an accredited lab. It is the Supplier's responsibility to confirm the conformance of their material to applicable standards for PPAP submission. It is also the Supplier's responsibility to plan for ongoing material conformance testing and identify this as a separate requirement (line item) in the Control Plan. This ensures that the Supplier has a plan for continual conformance to the material standard.

SL TN's expectation is that the Supplier have a designated lab (internally or externally) that is capable of confirming their raw material on a periodic basis. The interval of inspection is recommended by the Supplier however SLTN reserves the right to request a change in the frequency of inspection at any time throughout the life of the part.

A Material Test Result template is included in the Supplier PPAP Pack Forms

#### 24.2 Performance Test Results

Performance Test Results should meet the specifications. Performance results may include data confirming any referenced specifications in the part print or specific testing required by SLTN. SLTN will communicate specific material, performance, and testing requirements either the in part print, reference specifications or by specific request prior to PPAP approval. It is the responsibility of the Supplier to confirm the data and format for this requirement with their SL TN SQE.

A Performance Test Result template is included in the Supplier PPAP Pack Forms

### 25.0 International Material Data System (IMDS)

Every SLTN Supplier, because of national and international environmental legislation, is required to provide information about the material used in their product.

The Supplier is responsible for creating an IMDS module on every part that supplied to SLTN. The IMDS module must be submitted via the IMDS website ([www.mdsystem.com](http://www.mdsystem.com)) to SLTN recipient code of **119519**.

All material and components must be included in the submission. In addition, all plastic parts must be identified with appropriate ISO marking codes. The Supplier is also required to complete the Restricted Materials and Recyclability Reporting Certification.

It is the responsibility of all Suppliers to submit the necessary information into the IMDS database. As a result, the Supplier must require their Sub-Suppliers to submit IMDS to their appropriate recipient code. The Supplier is required to review their Sub-Supplier IMDS submission for compliance then disposition (approve or reject) the IMDS submission. Once the Supplier approves the appropriate Sub-Supplier submissions, the Supplier must use the approved Sub-Suppliers IMDS modules to build their own IMDS module to prior to submission to SLTN.

Once submitted, SLTN will review, then disposition, the IMDS module:

#### 25.1 IMDS Approval

If SLTN approves the Supplier's IMDS submission, the Supplier may then add the IMDS module number and revision number to the PSW and may submit for PPAP.

#### 25.2 IMDS Rejection

If SL TN rejects the Supplier's IMDS submission, the Supplier will receive the reason for the rejection. It is the Supplier's responsibility to correct the IMDS module and resubmit it to SLTN. Common causes for rejection include:

- **Incomplete part number**

The part number submitted in the IMDS must match the part number that is on the PSW and Purchase Order.

- **Warnings in the IMDS Module**

It is SL TN preference to reconcile the IMDS modules so that warnings are eliminated.

- **Error messages in the IMDS Module**

Errors in the IMDS module will result in automatic rejection.

- **Incorrect material classification**

The Supplier should reference GADSL (Global Automotive Declarable Substance List) for more information

If the Supplier has any questions regarding a rejection of an IMDS module, the SLTN SQE should be contacted.

## 26.0 Initial Process Study (Cpk, Ppk)

The purpose of the Initial Process Study (Cpk or Ppk) is to determine if the manufacturing process is capable of producing parts that will meet SLTN requirements. Initial process studies (capability) are mandatory for all KPCs. Studies performed on KPCs are performed per AIAG guidelines (i.e., actual production parts randomly sampled from a significant production run).

If the process that produces the parts involves multi-cavity tooling, the Cpk/Ppk index must reflect a process study from each individual cavity.

All Fit/Function KPCs require a Cpk index of 1.67 or greater or a Ppk index of 1.33 or greater. All Safety/Critical KPCs require a Cpk/Ppk index of 1.67 or greater.

Whether Ppk or Cpk index is used depends on the reason for the PPAP submission.

### 26.1 (Cpk)

Cpk is the capability index for a stable process. Cpk is used for the following:

- New part
- Part with revised specifications
- Part in which the material, process, location, or equipment has changed
- Part in which the material supplier has changed

A Process Capability Analysis - Cpk template is included in the Supplier PPAP Pack Forms

## 26.2 (Ppk)

Ppk is the Performance Index. Ppk is used for the following:

- Supplier is currently manufacturing the part but is a new supplier to SLTN
- Current supplier to SLTN that has supplied a large number of nonconforming parts

A Process Capability Analysis - Ppk template is included in the Supplier PPAP Pack Forms

## 27.0 Qualified Laboratory Documentation

The purpose of Qualified Laboratory Documentation is to ensure that the testing for PPAP has been performed by a qualified lab.

All Suppliers that have testing or measurement performed on site must provide the following in this section of the PPAP submission.

Record/Scope that identifies the testing to be done and it must include:

- List of the Supplier personnel's competency and training to perform the testing
- List of all test equipment used in process and offline
- List of methods and standards used to calibrate the equipment

If the Supplier is using an external lab for measurement and testing, the Supplier must use an accredited lab and provide proof of that accreditation. SLTN requires external labs be accredited to known lab accreditation standards such as A2LA and ISO 17025.

1. Provide a copy of the lab company's 3<sup>rd</sup> Party accreditation certificate.
2. Results must be on company letterhead and includes:
  - The name of the Lab
  - Date of testing
  - Standards used for testing have to be identified.

## 28.0 Appearance Approval

(Where applicable) The supplier shall submit a completed Appearance Approval Worksheet (AAW) and random cosmetic samples from the PPAP run to SLTN for review, approval and sign off. Upon approval, SLTN will send the signed form AAR back to the supplier for inclusion in the PPAP package. If cosmetic samples are rejected, the supplier will need to make process corrections per feedback provided. A PPAP submission will not be approved unless full cosmetic approval has been achieved.

## 29.0 Sample Parts

Sample Parts submitted to SLTN should be the actual samples measured in the dimensional element-element 10. Sample parts should be delivered with or before the submission.

If the product the Supplier is providing comes from a multi-cavity tool then the Supplier should provide two (2) parts from each cavity. A minimum of 6 samples should be included with the PPAP submission. Contact SLTN's Supplier

SQE to determine the proper department(s) to which to address the parts. Each sample part must be properly tagged and identified as a PPAP sample part with information listed below.

The box that ships the parts should also be clearly labeled as 'Unapproved PPAP Sample Parts' in order to avoid being misplaced or inadvertently mixed with approved production parts.

The Supplier's sample part tag must contain the following information:

- Supplier Name
- SLTN Part Number
- Revision Level
- SLTN Part Description
- Date of Manufacture
- Sample # ( \_ of \_ )
- SLTN Contact

PPAP Sample Part – Unapproved  
Supplier Name \_\_\_\_\_  
SLTN Part Number \_\_\_\_\_  
Revision Level \_\_\_\_\_  
SLTN Part Description \_\_\_\_\_  
Date of Manufacture \_\_\_\_\_  
Sample \_\_\_\_ of \_\_\_\_  
SLTN Contact: \_\_\_\_\_

**30.0 Master Samples**

The supplier must retain at least 1 Master Sample part per cavity, mold, tool, etc., that is representative of the PPAP production run. Master samples should be identified with approval date. The master sample shall be held by the supplier over the entire life of the program. Master samples must be held for each cavity, mold, tool, etc. that has been PPAP approved. The supplier's master sample should be available for review or to reference when part concerns arise

**31.0 Checking Aids**

Examples of checking aids include but are not limited to check fixtures, templates and custom gauges. The checking aid must be referenced on the warrant and in the Control Plan. If there is an associated number assigned to the checking device i.e. gage, it must be included on the Control Plan and SCAF. The following checking aids documentation must be submitted with the PPAP:

- Conformance to the design print (layout to print)
- Evidence of repeatability (GR&R study) for all KPC related features
- Evidence of calibration (Calibration Report)

The Checking Aid form is included in the Supplier PPAP Pack Forms

**32.0 SLTN Specific Requirements**

SLTN has four designated Customer Specific requirements. Each PPAP level requires a different combination of these specific requirements. The customer specific requirements for SLTN are:

- Tooling Loan Agreement
- Packaging Form
- Pre-Launch Control Plan
- Launch Inspection Report
- Special Process Assessment

SLTN reserves the right to request any of these at the time of PPAP submission or to request updates to these documents anytime during the life of the part. The Supplier should actively communicate with their SLTN SQE to facilitate the completion of these specific requirements prior to submitting PPAP for approval.

**32.1 Tooling Loan Agreement**

A signed Tooling Loan Agreement is mandatory for Suppliers using SLTN owned tools and must be completed prior to PPAP approval.

The **Tooling Loan Agreement** documents critical information including:

- Supplier’s acknowledgement of ownership of the tool(s)
- SLTN’s requirement for tool identification
- Supplier’s maintenance and repair responsibilities
- SLTN’s and Supplier’s tool damage liability
- Confidentiality / patent rights requirements

It is critical that all information on the **Tooling Loan Agreement** document and related attachments be filled out completely and for both the Supplier’s and SLTN Purchasing’s Representative to have signed and dated the Tooling Loan Agreement document.

The Tooling Approval Form is included in the Supplier PPAP Pack Forms

**32.2 Packaging Form**

Suppliers are required to submit a Packaging Form that defines a pack that meets all SLTN related requirements and ensures the prevention of shipping and handling defects. The Supplier’s proposed packaging design should be documented in SLTN’s Packaging Form.

The Packaging Form must be filled out in detail and all questions answered. It is important that there be clear pictures of the pack in all of the four areas specified:

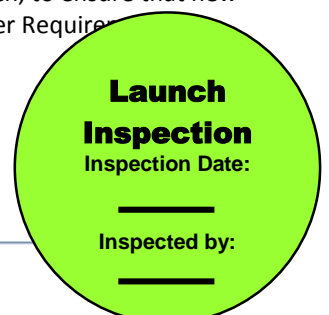
- A picture of the part in packaging position
- A picture of the outside container with label
- A picture of any dunnage for the container
- A picture of the final unit (loaded)

The Packaging Form is included in the Supplier PPAP Pack Forms

**32.3 Launch Inspection Program**

Suppliers are required to implement a formal Launch Inspection Program for all products requiring PPAP. The purpose of a Launch Inspection Program is to provide additional controls, at launch, to ensure that new (or new to SL TN) products, when shipped, will meet SLTN’s requirements (ref. Supplier Requirements Manual).

A Launch Inspection Program requires, at a minimum, off line - 100% inspection of product (Launch Inspection). Launch Inspection controls shall be documented on the



Control Plan and Special Characteristics Approval Form (SCAF) or in the Supplier's preferred format.

Supplier is responsible for marking the boxes as certified by placing a green Launch Inspection sticker on the outside end of each container (not the top). This information should be communicated and documented up front to avoid confusion. SL's designated SQE will review and approve all exceptions or clarifications to these requirements.

The supplier is to request in writing to be removed from Launch Inspection by submitted a Supplier Request to Remove Launch Inspection form to the appropriate SL TN Supplier Quality Engineer. The SL TN SQE will notify the supplier of approval of removal of launch inspection or the reason for rejection.

If the request for removal from launch inspection is rejected, the SQE will provide the supplier with new exit criteria. Once the supplier has successfully meet the new criteria they may submit a new request for removal from launch inspection.

Until the supplier has a signed copy of the Supplier Request to Remove Launch Inspection form, the supplier is required to continue to perform launch inspection including identifying containers with the appropriate launch inspection stickers.

#### **32.4 Special Processes Audits**

Suppliers with internal or outsourced "special processes," as identified by AIAG are required to show conformance with relevant AIAG Special Process document:

- CQI-9 - Heat Treat Assessment,
- CQI-11 - Plating System Assessment,
- CQI-12 - Coating System Assessment,
- CQI-15 - Welding System Assessment
- CQI-17 - Soldering System Assessment.
- CQI-23 - Molding System Assessment

A 3rd Party or self-audit is required to be performed annually by the supplier or their outsourced sub-suppliers using the applicable AIAG CQI Assessment, as part of their PPAP submission (ref. SLTN's Supplier Quality Manual).

SL TN requires detailed auditor credentials that meet each standard requirement. Evidence of auditor credentials must include both:

- Experienced quality Management system (QMS) auditor and
- Five years of specialized process knowledge (this will very based on which assessment is required)

The supplier and / or their sub-suppliers are required to submit a current Assessment of each applicable special assessment include auditor credentials, with the PPAP package. Failure to do so will result in a delay of obtaining PPAP approval.



**33.0 Supplier Agreement and Sign off**

By signing below supplier fully understands, accepts and intends to comply with the requirements contained within this document.

Note: The supplier is required to sign and return this sheet to SL Tennessee Purchasing. If purchasing does not receive the signed acknowledgement of SL Tennessee requirements, the supplier will be placed on new business hold.

_____ <b>(Print) Supplier Quality Manager</b>	_____ <b>Date</b>	_____ <b>(Print) Supplier Procurement</b>	_____ <b>Date</b>
_____ <b>(Sign) Supplier Quality Manager</b>	_____ <b>Date</b>	_____ <b>(Sign) Supplier Procurement</b>	_____ <b>Date</b>

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