PPAP
Production Part
Approval Process

18 PPAP Elements

1- Design Records (part drawings)

2- Engineering Change Documents (any changes incorporated in the part but not yet in the part design)

3- Engineering Approval

4- Design FMEA (n/a if not design responsible)

5- Process Flow Diagram

6- Process FMEA

7- Control Plan (Pre-Launch and Production)

8- MSA Studies (gage R@R analysis)

9- Dimensional Analysis (6 samples minimum)

10- Material / Performance Test Result (mtl COAs should be less than one year old)

11- Initial Process Studies (capability studies)

12- Qualified Lab Documents (internal and external to the organization if applicable)

13- AAR (Appearance Approval Report), note OEM color aprvl may also be required

14- Sample Product

15- Master Sample

16- Checking Aids

17- Customer Specific Requirements

18- PSW (Part Submission Warrant)

Summit PPAP Requirements

With OEM Approval

- Evidence of OEM approval, this is typically an approved copy of the OEMs PSW.
- Level 1 PSW for Summit to approve, must include evidence of IMDS approval to Summit's IMDS site (1563). Should also reference Summit's part number as the 'Customer' part number.
- AAR approval if applicable.
- Copy of part Drawing.
- Copy of OEM approved Capacity Analysis Report if applicable.
- Copy of Packaging Information Sheet (PIS)

Without OEM Approval

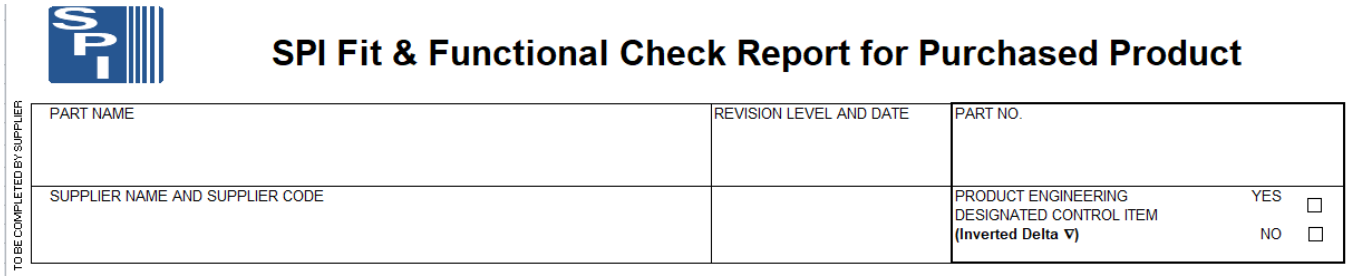
- AIAG Compliant Level 3 PPAP (supplier should have a copy of the latest revision level AIAG PPAP Manual for reference). Note; in some instances the OEM PPAP format may be required such as Ford Phased PPAP or Nissan ANPQP PPAP.
- Evidence of IMDS approval to Summit's IMDS site (1563).
- All PPAPs must be submitted in one pdf file per part number (exceptions require the approval of the SDE).
- All PPAPs must be submitted to your Summit Corp Purchasing Buyer.
- PPAP approvals are communicated via the receipt of the signed PSW.
- On Time PPAP submissions are included in the suppliers monthly Performance Evaluation.

Summit Customer Specific Requirements

- Summit has 2 proprietary forms which must be submitted prior to PPAP and signed by SPI, then incorporated into the supplier PPAP submission. The next few slides will go into more detail on these forms.
  - The Summit Fit & Function form
  - The Packaging Information Sheet (PIS)
- In addition, the Summit Capacity Verification Report must be submitted with PPAP
  - PPAPs for components for which the final customer/OEM is Ford Motor Company are an exception to this, as the Ford Capacity Analysis Workbook must be used in these cases

Summit Fit & Function Form

- The Summit Fit & Function Form is very simple for supplier use, as the supplier is only required to fill out the header information with basic data, as seen below
- The Fit & Function Form is to be submitted **prior** to PPAP, along with PPAP samples
  - The responsible plant personnel evaluating the samples will approve or reject the form, and return it to the SDE for returning to the supplier.
  - Any rejections will have reasons listed, it is the suppliers responsibility to address the issue causing the rejection and resubmit the form and parts for re-evaluation.
  - The supplier should then include the **approved** Fit & Function Form in the PPAP being submitted



SPI Fit & Functional Check Report for Purchased Product

TO BE COMPLETED BY SUPPLIER

PART NAME	REVISION LEVEL AND DATE	PART NO.
SUPPLIER NAME AND SUPPLIER CODE		PRODUCT ENGINEERING DESIGNATED CONTROL ITEM **(Inverted Delta ∇)** YES ☐ NO ☐

Summit Packaging Information Sheet (PIS)

- The Summit Packaging Information Sheet is an integral part of the PPAP package, which aims to ensure that the packaging chosen by the supplier is appropriate for both parties, mainly focusing on ensuring 3 things:
  - That the packaging has been adequately tested and validated to protect the part from damage
  - That the packaging can be easily and safely handled by personnel at both the supplier and Summit plants (as well as the OEM plant, when applicable)
  - That the footprint of the packaging is workable and usable within the layout of the Summit plant/assembly line (as well as the OEM plant, when applicable)
- Filling out the PIS itself is fairly straightforward, and consists of the following
  - Simple header information regarding the supplier manufacturing facility, the receiving Summit facility, and the part itself
  - Information on the arrangement of the parts within the containers
  - Details on dunnage used
  - Fields to denote packaging method, shipping type, and weights of skids
  - Separate fields to place pictures of an individual part, a container of parts, and a standard skid of those parts
  - Fields for both supplier and Summit approval

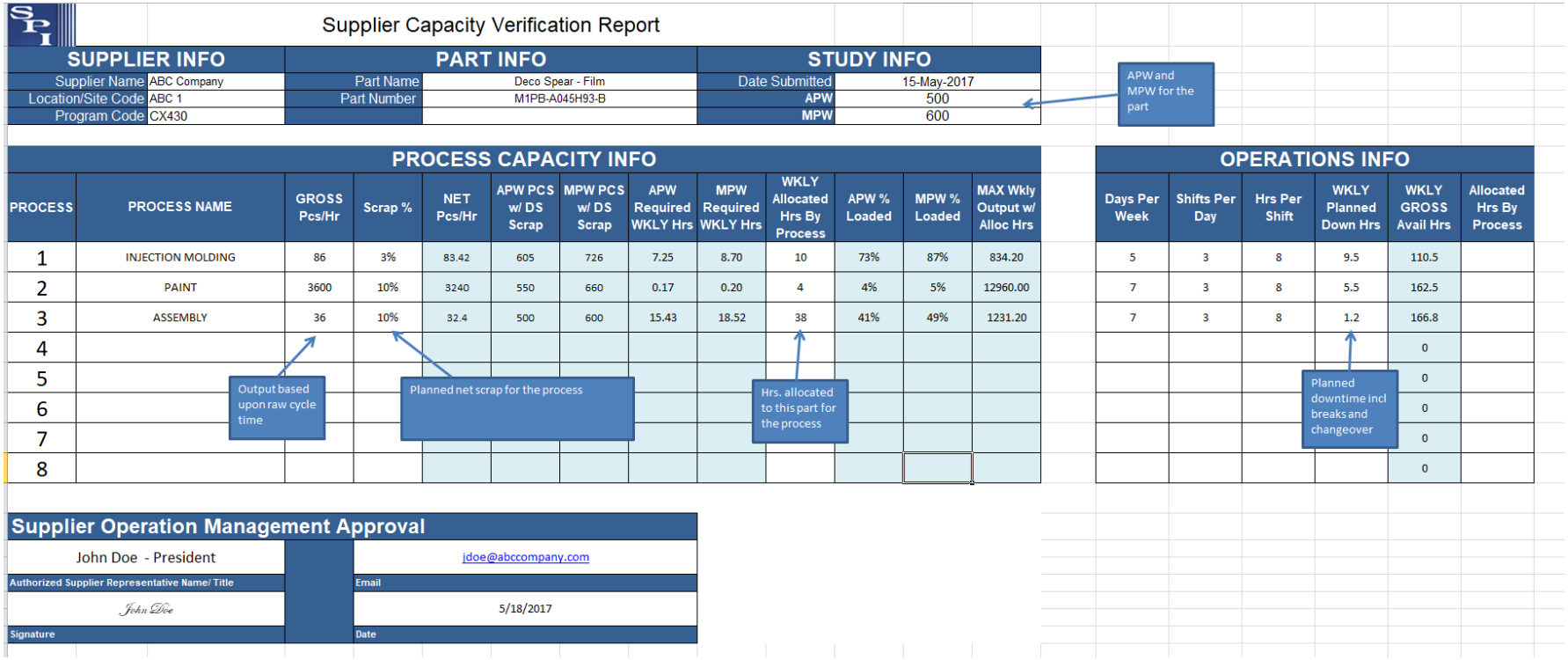
Important Notes Regarding the PIS

- The PIS should be filled out by the supplier **completely** and sent to the Summit SDE for distribution within our organization and plant approval **prior** to submission of PPAP. The copy of the PIS going into the supplier PPAP package should already have **Summit Approval!**
- SPI approval does not imply that we take responsibility for the quality of parts in the approved packaging. Damage to parts caused by packaging material / packaging design remain responsibility of the supplier.
  - Specific exceptions in instances where the SPI plant dictates the style of packaging and/or dunnage may be made on a case-by-case basis.
  - Packaging should be validated through packaging "Ship and Drop" tests by a reputable source. (i.e. 3000 miles and 8,000 miles overseas). For individual boxes vibration and compression should be tested per ISTA 2A. For unit or pallet loads vibration and compression should be tested to ISTA 3E.

Summit Capacity Verification Report

- The Summit Capacity Verification report is used to ensure that the supplier has the capacity available at their chosen location to produce the volume of parts required by Summit.
- Unlike the other 2 forms which have been discussed, the Capacity Verification Report is formulated after a true Run at Rate at the home-line location of the supplier, and is not expected to be sent in prior to submission of PPAP.
  - In fact, the Capacity Verification Report is one of the last documents which the supplier should be completing during the PPAP process, as the other quality and production documentation/procedures should be well developed before R@R (PFMEA, Control Plan, Flow Chart, Standard Work/Operator Work Instructions etc.)
- Filling out the Capacity Verification Report is fairly straightforward, as it does include an instructions tab within the workbook itself, outlining how it should be completed

Summit Capacity Verification Report



Supplier Capacity Verification Report

SUPPLIER INFO		PART INFO		STUDY INFO	
Supplier Name	ABC Company	Part Name	Deco Spear - Film	Date Submitted	15-May-2017
Location/Site Code	ABC 1	Part Number	M1PB-A045H93-B	APW	500
Program Code	CX430			MPW	600

APW and MPW for the part

PROCESS CAPACITY INFO

PROCESS	PROCESS NAME	GROSS Pcs/Hr	Scrap %	NET Pcs/Hr	APW PCS w/ DS Scrap	MPW PCS w/ DS Scrap	APW Required WKLY Hrs	MPW Required WKLY Hrs	WKLY Allocated Hrs By Process	APW % Loaded	MPW % Loaded	MAX Wkly Output w/ Alloc Hrs
1	INJECTION MOLDING	86	3%	83.42	605	726	7.25	8.70	10	73%	87%	834.20
2	PAINT	3600	10%	3240	550	660	0.17	0.20	4	4%	5%	12960.00
3	ASSEMBLY	36	10%	32.4	500	600	15.43	18.52	38	41%	49%	1231.20
4												
5												
6												
7												
8												

Output based upon raw cycle time

Planned net scrap for the process

Hrs. allocated to this part for the process

OPERATIONS INFO

Days Per Week	Shifts Per Day	Hrs Per Shift	WKLY Planned Down Hrs	WKLY GROSS Avail Hrs	Allocated Hrs By Process
5	3	8	9.5	110.5	
7	3	8	5.5	162.5	
7	3	8	1.2	166.8	
				0	
				0	
				0	
				0	
				0	

Planned downtime incl breaks and changeover

Supplier Operation Management Approval

John Doe - President		jdoe@abccompany.com
Authorized Supplier Representative Name/ Title		Email
John Doe		5/18/2017
Signature		Date

Summit PPAP Approval

- After your PPAP has been submitted, the PPAP is reviewed by the SDE assigned to your commodity. If any issues are found with the PPAP submission, they are noted on the Summit PPAP matrix form (example on next slide), and sent back to the supplier for correction.
  - corrections must be a done in a timely manner and responses should be received within a week.
  - Once the Supplier Development group is satisfied that all requirements are met, the PPAP is forwarded to the responsible party at the manufacturing plant for approval through Sharepoint.
- The Summit plant/person responsible for reviewing the PPAP will sign off on the PSW as: **Approved**, **Rejected** or **Interim** approved.
- If the PPAP is **Approved** then the supplier is authorized to start shipping the product per Summit's releases.
- If the PPAP is **Rejected**, the PPAP will be sent back to the responsible Summit SDE with a list of issues. The SDE will then update the PPAP matrix, and forward it to the supplier for further corrections.
- If the PPAP is **Interim** approved then the supplier is authorized to start shipping product per the criteria listed on the interim approval. The supplier should work with the Summit SDE to resolve the issues in the PPAP that lead to the interim status.
- If the supplier wants to change the part and/or process after a part has been PPAP approved then an Engineering Change Request must be submitted to your Summit Corp Purchasing Buyer to review for feasibility (see AIAG PPAP Manual for copy of Engineering Change Request form).

Summit PPAP Matrix form

- The Summit PPAP Matrix form is a guide used by the Summit SDE group to evaluate each PPAP which is submitted by the supply base
- The form includes a header section and sections for evaluation of each of the 18 PPAP elements
  - The sections pertaining to each PPAP element includes several criteria which the SDE's evaluate for each element, which are deemed to be key criteria. There is a field for the SDE to denote whether the criteria is being met, as well as a field to enter comments/explanations. The SDE group strives to be helpful and concise with the comments entered, to guide the supplier to the proper corrections as quickly as possible.
    - Pictures illustrating the issue can also usually be found on the right-most margins of the form, if applicable.
- Once the supplier receives this form, they are not expected to modify the form itself, or add any comments. The form is simply an efficient guide for the supplier to make corrections to the PPAP, so that it may be further processed.
- Once all the corrections needed are completed, please resubmit the full PPAP in one PDF file.
- Requested corrections are to be completed on an expedited basis, typically in 3 days or less.
- If the PPAP is approved straight away upon initial submission, it will be forwarded to the Summit Plant for final approval and signoff.

Summit PPAP Matrix form

	KBPD 06.01.01		Rev Level: C
	PPAP Matrix		Rev Date: 9/6/2018
	C = CUSTOMER	**Summit Part Number**	**Program**
	NA = NOT APPLICABLE	**Part Description**	**Buyer**
	X = COMPLETED	**Customer Part Number**	**SDE**
	IC = INCOMPLETE	**PPAP Due Date**	**Review Date**
	Place any notes in as comments		
1	**DESIGN RECORDS**		**COMMENTS**
	Correct drawing per part number?		
	Record(s) approved and ECL clearly identified?		
	All critical dimensions identified?		
	All required spec's identified in an acceptable manner?		
	Marking of Polymeric Parts identified?		
2	**AUTHORIZED ENGINEERING CHANGE DOCUMENTS**		
	Are Authorized Engineering Change document(s) included (if required)?		
3	**CUSTOMER ENGINEERING APPROVAL**		
	Is Customer Eng'g Approval(s) included (if req'd)?		
4	**DESIGN FMEA**		
	Form AIAG 'current' Edition compliant (or equivalent)?		
	Correct part number and/or name per drawing?		
	DFMEA Revision Date identified?		
	RPN Values accurate and high RPN's addressed?		
5	**PROCESS FLOW DIAGRAM**		
	Correct part number and/or name per drawing?		
	Revision Level of document identified?		
	All production process steps and sequences defined?		
6	**PROCESS FMEA**		
	Form AIAG 'current' Edition compliant (or equivalent)?		
	Correct part number and/or name per drawing?		
	PFMEA Revision Date identified?		
	Severity Value ≤ 6 for all non-critical, interior parts?		Excludes Flammability
	RPN Values accurate and high RPN's addressed?		
	Failure modes incurred during pilot builds included?		
	All process steps keyed to Control Plan?		
	Are SC/CC/HI's identified on the PFMEA? Keyed into the C/P?		

Troubleshooting Common PPAP Issues

- The next grouping of slides will deal with issues commonly found by the Summit SDE group in PPAPs submitted by the supply base
- Where possible, pictures and examples will be provided to help illustrate the point at hand
- Rather than being a negative, it is our hope that these examples will help the supply base to avoid these type of issues in the future. As it is the case that most of the issues we see with PPAPs belong to a small group of oft-repeated mistakes, educating the supply base on these should help to avoid these issues in the future
- As a result of this education process, we hope to make the PPAP approval process faster and more efficient, by requiring less revision loops. This behooves both Summit and the supply base, as nobody in automotive enjoys waiting until the 11th hour prior to intended SOP for PPAP approval.
  - Or worse yet, to find out their PPAP is still not approvable just before production is due to start!

Incorrect PFMEA Values

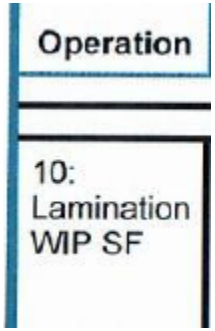
- One common issue seen by the SDE group is that the values reflected in PFMEA's for Severity/Occurrence/Detection of the various failure modes are not in keeping with the values proscribed in the AIAG PFMEA manual, with the most common sub-issues being
  - Severity values being too low
  - Detection values being too low
- Downplaying the values on the PFMEA diminishes the value of the PFMEA as a tool for detecting costly quality issues before they occur
- In the below example, visual detection is given a PFMEA detection rating of 4, whereas the AIAG PFMEA Manual Proscribes a rating of 8

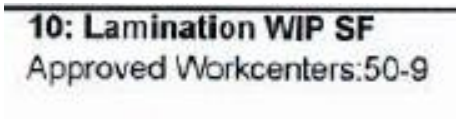
Spinning(Front)	Scratch	Customer's complaints	2		Careless handling	5	Machine Set up / jig	Visual inspection	4

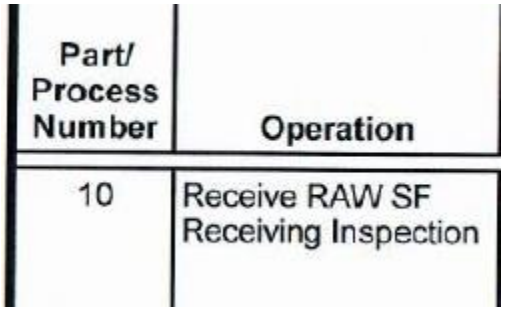
Problem Detection Post Processing	Failure Mode detection post-processing by operator through visual/tactile/audible means.	8

Illogical flow of quality documents

- Another issue that we see, is a lack of flow between the PFMEA, Control Plan, and Flow Diagram
  - These 3 documents should all describe the same production steps, and use the same process step numbers to refer to them
  - All 3 documents should cover the full manufacturing process; from raw material receiving, to final shipment to the customer, and every step in between
- The below example is one where Process Step number “10” is assigned to one process in the PFMEA and Process Flow, but a completely different process in the Control Plan







Incorrectly Completed Capacity Studies

- Common issues seen with supplier-submitted Capacity Studies/Capacity Analysis Reports include:
  - Disagreement between run rate on PSW vs run rate reflected in CAR
  - Shared loading information not being filled out completely in cases where a line is shared between several different part numbers or customers
  - Suppliers replacing formula's in cells with hard, manually generated numbers
  - OEE over 100%

Inadequate process capability as reflected in reports

- Initial process studies are expected to reflect a Cpk/Ppk of at least 1.33 at PPAP for non-critical characteristics
- Critical characteristics are expected to reflect a Cpk/Ppk of at least 1.67 at PPAP, and a demonstrable on-going capability of Cpk/Ppk 1.33 throughout the life of production
- Occasionally, we do see PPAP's submitted with initial process studies not hitting these targets