NCR PPAP USER GUIDE

REVISION HISTORY

Rev.	Date	Originator (E-Signature)	Approved By (E-Signature)	Description of Change
A	Feb - 2013	Thivya. N	Rajesh Kanna	Initial release
B	Oct - 2014	S.Ganesha Pandian	Phani Kumar Vutukuri	1. PPAP level matrix modified as per AIAG 2. Section 7.2,7.2.1,7.2.2 & 7.2.3 deleted 3. ETQ flow added 4. 9.3 RoHS standard revision modified <u>How to fill up PPAP Playbook</u> 5. Section 3,4,5 updated with "Allowed to use Suppliers Own Format" – In line with Playbook G 6. Section 8,10,11,14 - Explanation added in line with Playbook G

Special Comments:

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HOW TO COMPLETE PPAP PLAYBOOK?

Process

Owner:	**PPAP TEAM**	Effective:	**Dec 2014**	Reviewed:	**Dec 2014**
Subject:	**Production Part Approval Process (PPAP) requirements**	Number:	**445-9001377**	Rev:	**B**

Supplier Quality Mission:

"Create processes & infrastructure within NCR and our supply base to insure all active parts are consistently statistically capable, going into the supply chain"

1. Purpose

To define NCR Production Part Approval Process for purchased parts

- To ensure that supplier can meet the manufacturability and quality requirements for the purchased parts
- To provide evidence that the customer engineering design record and specification requirements are clearly understood and fulfilled by the supplier
- To demonstrate that the established manufacturing process has the potential to produce the part that consistently meets the all NCR requirements during the actual production run at the quoted production rate

To enable clear understanding of suppliers' on NCR PPAP & relevant documentation requirements

2. When is a PPAP submission required?

In general, a PPAP is required anytime when a new part or a change to an existing part/process is being planned. It is the discretion of NCR to determine when and if a PPAP submission is required. As a Supplier you should have all the necessary documentation ready for submission to NCR upon PPAP request

PPAP is not required for A and B Builds. This is required for only C Build.

3. Scope

Suppliers may be requested for PPAP submission based on the following, but not limited to:

- NCR Design needs
- NCR Site / Business needs
- NCR New Product Introduction needs
- NCR Life cycle design changes
- Change in Material or Sub-supplier
- Manufacturing location change
- New tool / Tooling modification at supplier
- Supplier / Sub-supplier mfg. process changes
- NCR PPAP process applies when there is a request for PPAP submission has been made to the supplier

4. Definitions & Terminologies

4.1 NCR PPAP - A documentation package that is submitted to provide the evidence needed to show that all NCR engineering design record and specification requirements are properly understood by the supplier and that the designed process has the potential to produce parts consistently meeting these requirements during an actual production run at the quoted production rate

4.2 Other Terms & Definitions

AIAG – Automotive Industry Action Group
ASTM – American Society for Testing and Materials
AT – Acceptance Test
AVL – Approved Vendor List
AR – Appearance Report
DFMEA – Design Failure Mode Effects Analysis
ETQ – Excellence thro Quality
FAI – First Article Inspection
GRR – Gauge Repeatability & Reproducibility
MSA – Measurement System Analysis
MIP – Manufacturing Incorporation Point
NPI – New Product Introduction
PFD – Process Flow Diagram
PFMEA – Process Failure Mode Effects Analysis
PW – Production Warrant
RPN – Risk Priority Number
RoHS – Restriction of Hazardous Substances
RFQ – Request for Quote
RCD – Required Closure Date
RFC – Request for Change – NCR Internal system through which request for approval is sent to respective approval authority in the cases like not limited to change in the part, drawing, capability issues, etc.,
SDE – Supplier Development Engineer
SQE – Supplier Quality Engineer
SCAR – Supplier Corrective Action Report
CAPA – Corrective Action Preventive Action
SOP – Standard Operating Procedure

4.3 NCR PPAP Submission Levels

- Level1: Production Warrant & with RoHS/Appearance Report
- Level2: Production Warrant with Limited supporting documents
- Level3: Production Warrant with complete supporting documents
- Level4: Production Warrant and requested documents
- Level5: Production Warrant with Product samples & complete supporting document available for review at manufacturing location of supplier
- E Audit: Production Warrant with requested documents
- Engg FAI: Only requested documents to Engg Team

4.4 Disposition Status

PPAP/PQV disposition status shall be communicated to the supplier as per below

4.4.1 **Approval**: Submission and accompanying documents meet NCR PPAP requirements. Approval shall be provided through the Production Warrant document signed by the NCR PPAP Review team representative through ETQ. Supplier is authorized to ship the production parts to the appropriate NCR location.

4.4.2 **Rejected**: When the submitted PPAP/PQV E Audit documentation does not meet the NCR PPAP/PQV requirement. Rejection status is communicated to the supplier through ETQ with reasons for rejections clearly mentioned in the body of the mail. Supplier shall resubmit the corrected documentation for approval. Supplier shall also contact the PPAP team through the above mail id for any clarifications needed regarding the rejection.

For any PPAP/PQV rejection, a CAPA will be raised against the failure mode. Supplier needs to close the CAPA with their corrective action report in ETQ within the given time period.

4.4.3 **Interim Approval**: Based on the business priority, an interim approval may be given for a PPAP with appropriate internal deviation approvals. It permits the shipment of material for production requirements on a limited time period or limited quantities.

Supplier is responsible for implementing containment actions to ensure that only acceptable material is being shipped to NCR. No additional shipments are authorized unless an extension of Interim approval is granted by NCR.

If the issue is related to NCR, upon completion of necessary actions by the concerned action owners, PPAP team will offer final approval to the part and send the signed PW to the supplier.

5. Documents

5.1 PPAP Playbook - 497-0469479

6. Process Requirements

6.1 **General Guidelines**

PPAP submission, when identified and/or communicated as required, must be completed and approval obtained prior to shipment of the first production lot of parts. PPAP approval shall be communicated in the form of NCR Production Warrant. PPAP submission is requested to you by NCR in the following situation, not necessarily limited to:

- New Part/Product or New Tool
- Engineering Changes to design records,
- Tooling Transfer, Replacement, Refurbishment
- Correction of Discrepancy
- Material change
- Sub-supplier change
- Change in Part Processing
- Sub-supplier or Material Source Change
- Supplier Manufacturing location Change

- PPAP team assigns the PPAP Submission level during the PPAP request.
- Generally PPAP Levels differ only on the document submission Vs Retention. Hence it is the responsibility of the supplier to keep updating all the necessary documents at their end per Level 3 requirements and ensure it is readily available for NCR upon request.
- Also PPAP records should be maintained by the supplier and updated periodically as necessary to reflect current revision levels (e.g. PFMEA, Control plan, MSA records etc.)

6.2 **Submission Levels:**

For PPAP/PQV & Engg FAI levels and the requirements, please refer FIG 1.

Eng FAI, PPAP & PQV Levels for Submission & Retention								
		Submit to Eng team	Submit to PQV team	Submission Levels				
				Submit to PPAP team				
Tab No	Requirements	Eng FAI**	E Audit	Level 1	Level 2	Level 3	Level 4	Level 5
1	Design Record, if applicable (Supplier Design)			R	S	S	*	R
1a	Balloon drawing	S	S	R	S	S	*	R
2	Engineering Change Documents, if any			R	S	S	*	R
3	Customer Engineering approval, if required			R	R	S	*	R
4	Design FMEA, if applicable (Supplier Design)			R	R	S	*	R
5	Process Flow Diagrams			R	R	S	*	R
6	Process FMEA			R	R	S	*	R
7	Control Plan			R	R	S	*	R
8	Gage R&R Study			R	R	S	*	R
9a	Dimension Report - Non Critical dimensions	S	S	R	S	S	*	R
9b	Dimension Report - Critical dimensions		S	R	S	S	*	R
10a	Material Test Report	S	S	R	S	S	*	R
10b	Performance test results if applicable			R	S	S	*	R
10c	RoHS compliance Report	S		S	S	S	*	R
10d	Salt spray Test report - If applicable		S	R	S	S	*	R
11	Initial Process Studies			R	R	R	*	R
12	Qualified Laboratory Documentation			R	R	R	*	R
13	Appearance Report - If applicable	S***	S	S	S	S	*	R
14	Sample Product	S		R	R	R	*	R
15	Master Sample			R	R	R	*	R
16	List of Checking Aids			R	R	R	*	R
17a	NCR Engineering Approval - If applicable	S		R	R	R	*	R
17b	Sub supplier source details - If applicable			R	S	S	*	R
17c	Packaging Test Report - If applicable			R	S	S	*	R
18	Production Warrant (PW)		S	S	S	S	S	R
19	Bulk Material Checklist, If applicable			R	R	R	*	R

FIG 1

S – The supplier needs to submit the relevant documents to NCR and retain a copy of records or documentation items at appropriate locations (for Fast – To – Market – to be submitted within 90 days from the date of Interim Approval)
R – The supplier shall retain the relevant documents at appropriate locations and make readily available to NCR upon request
* - The supplier shall retain at appropriate locations, and submit to NCR upon request. NCR will advise which documents to be submitted
** - No additions shall be made to FAI requirements without full approval of all Engineering Directors
*** - Drawing Notes confirmation ONLY

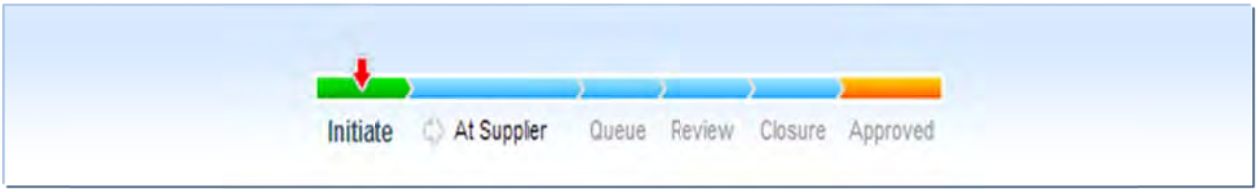
7. **PPAP Request to Supplier:**

7.1 How will you receive PPAP request from NCR?

NCR PPAP team representative will send request for PPAP and RCD with details of Part no, Revision, PPAP level, NCR Project Program name, etc. through ETQ from mail ID ppap.ncr@ncr.com

Once supplier receive PPAP request, supplier needs to provide confirmation through ETQ

ETQ Flow:



- Red Arrow denotes, current stage of the PPAP status

	Initiate	At Supplier	Queue	Review	Closure	Approved
Responsibility	NCR PPAP Team	Supplier	NCR PPAP Team	NCR PPAP Team	NCR PPAP Team	Completed
Flow Summary	Awaiting PPAP request to Supplier	Awaiting PPAP Submission/Re-Submission	For PPAP Schedeling to PPAP Reviewer	Under Review	Issue in PPAP, under discussion, Clarification and Awaiting RFC Approval	End

To View PPAP Request

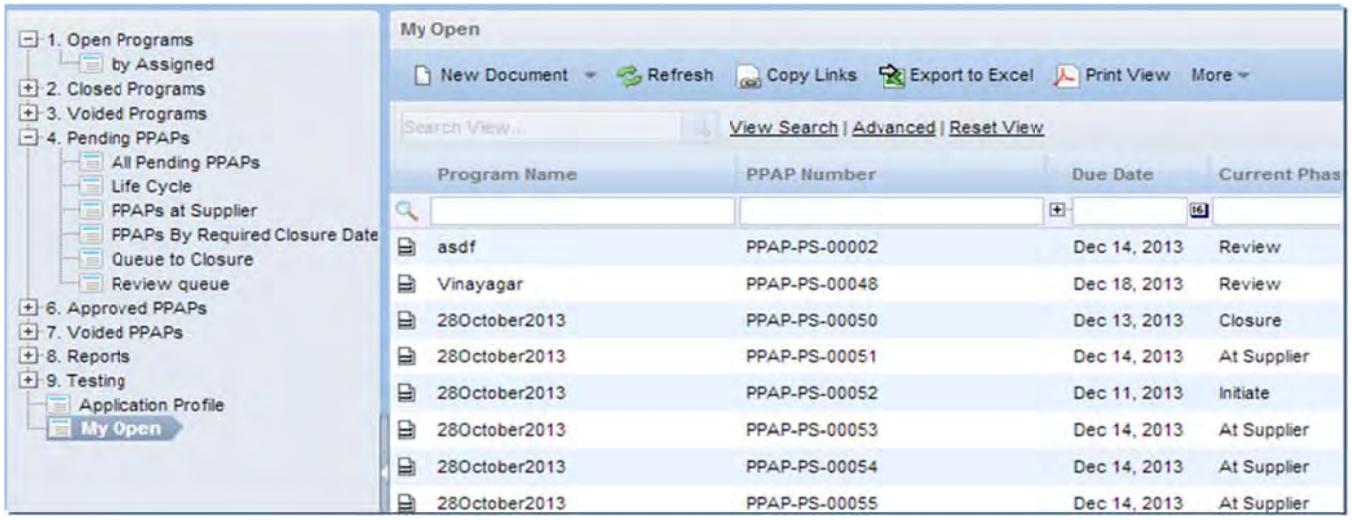


FIG 1A

- Go to “My Open”
- To view the request details of specific Part Number, just click the row as marked above.
- New Window will open for the PPAP requested

PPAP Required Closure Date	Program Name	Assigned	Supplier Name	Parent Part Number	Child Part Number
Jan 31, 2014	DEMOTRAININGPPAP10DEC13	Rajesh, kanna	3M - UK	123-123456789	
Jan 31, 2014	DEMOTRAININGPPAP10DEC13	Rajesh, kanna	3M - UK	123-123456789	
Dec 31, 2013	DEMOTRAININGPPAP10DEC	Rajesh, kanna	3M - UK	123-123456789	
Dec 31, 2013	DEMOTRAININGPPAP10DEC	Rajesh, kanna	3M - UK	123-123456789	
Dec 31, 2013	FINALUATNPI13DEC	PG,BALAJI	Nash	445-0739575	497-0455813
Dec 31, 2013	FINALUATNPI13DEC	Arul,Muthukumar	Nash	445-0739575	497-0461866

FIG 1B

To View the details of PPAP Request

- Click on the PPAP Part number
- Separate window open as shown in Fig 1C

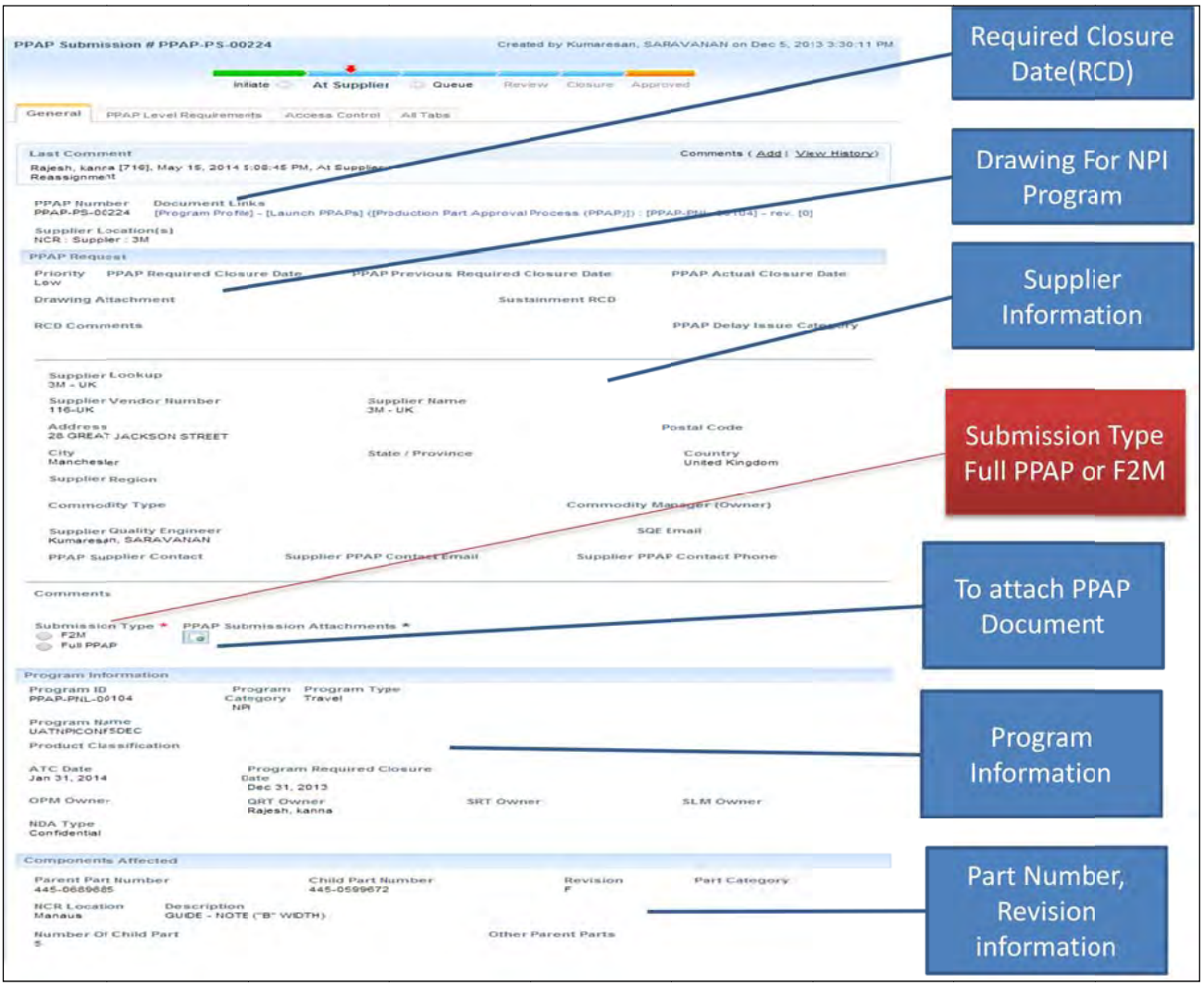


FIG 1C

Click Tab “PPAP Level Requirement” as per Fig 1D

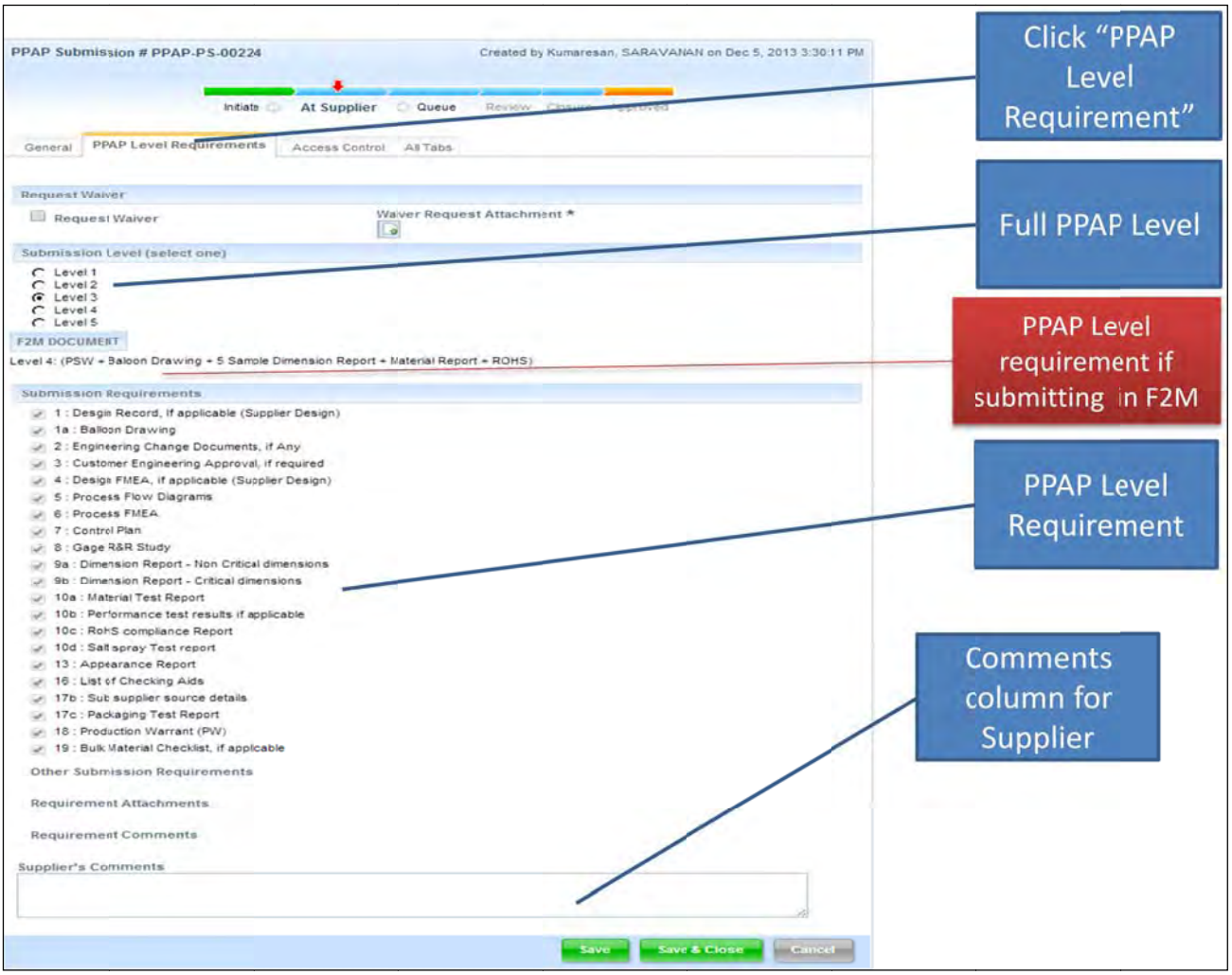
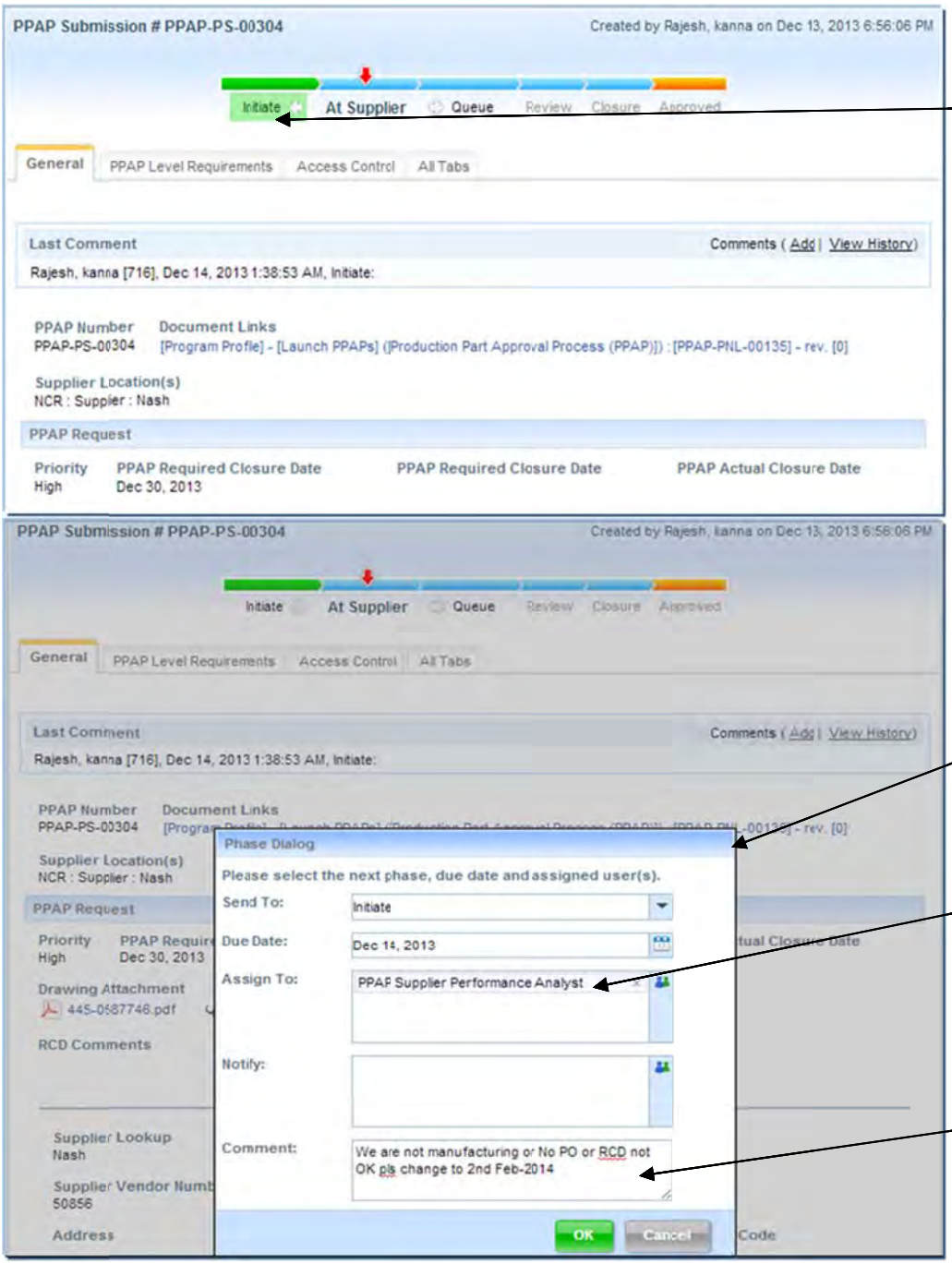


FIG 1D

Return / Reverse PPAP Request to NCR – Ref FIG 1E

Use this option for below reasons. Please share feedback on, reason for return

1. Part not manufactured by Supplier
2. PO not available to manufacture the part
3. Change in Required Closure Date (RCD)
4. Other issue, not able to support PPAP



Click Tab "Initiate"

Sub Screen will Pop-Up

No Need to edit this information

Specify the Reason for return/Change in RCD here

FIG 1E

7.1.1 What to do if PPAP request is not received from the PPAP team?

1. Inform respective Commodity Manager that you have not received a PPAP request for the part
2. Email to ppap.ncr@ncr.com and provide the Part Number, Revision and reason for which the PPAP is being done
3. Based on the Input, PPAP team will give request as explained above.

7.1.2 Whom to contact regarding part issues prior to PPAP submission?

Send an e-mail to ppap.ncr@ncr.com and ppapreviewteam.ncr@ncr.com clearly explaining the issue regarding the part. Issue will be given to the appropriate person so that it can be resolved prior to submission.

Note: Don't submit any PPAP with known issues such as Out of Specification, Cpk fail etc.

7.2 How the supplier should submit PPAP?

- Supplier must submit the PPAP Electronically through ETQ only.
- Supplier must use the latest NCR PPAP Playbook only. Latest NCR Playbook can be downloaded from http://www.ncr.com/documents/ppap-playbook.xls

7.3 What is Required Closure date?

RCD means Required Closure Date.

How is RCD derived?

- NPI program required closure date, after confirmation from CM on readiness at supplier end.
- Based on historic development/PPAP approval lead time.

What to do if you cannot meet RCD?

- Inform the PPAP team in advance if there are issues found with the parts that are preventing you from meeting RCD.
- PPAP team will revise RCD based upon the issue and reasons given.

How is supplier measured in PPAP for RCD?

Supplier is measured based on the number of Commitments/Targets met against the total numbers of PPAPs. As an Example:

Total PPAP = 20,
Number of PPAP approved on or before Committed Date = 17,
Number of PPAP approved after committed date = 3

CCD/RCD % ---→17/20 = 85.00%

7.4 NCR PPAP PROCESS:

Below is the High Level PPAP Process - Refer FIG 2

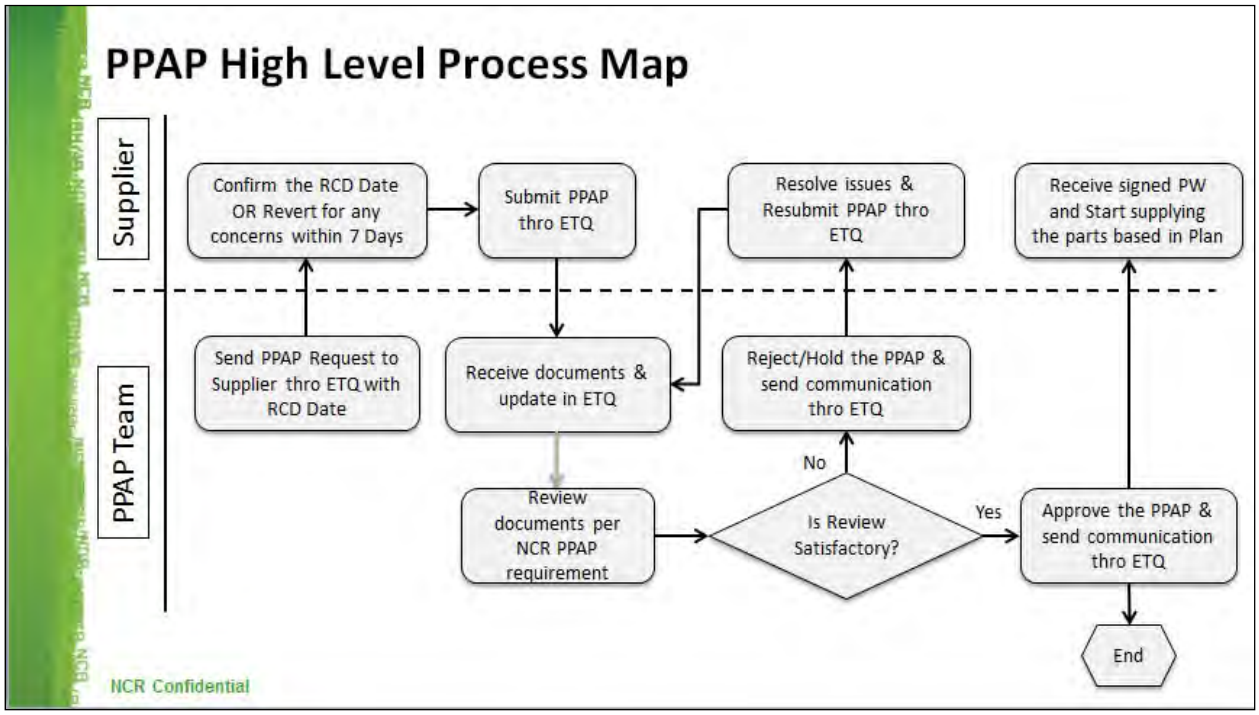


FIG 2

8. Explanation on PPAP requirements

8.1 Requirement 1: Design Records

- It is the copy of the drawing, if supplier is responsible for designing the part.
- The purpose of design records and ballooned drawings is to document the formal part print and any additional engineering records for reference. This design record must be available upon request by NCR.

8.2 Requirement1a: Balloon drawing

- A Ballooned drawing shows parts or assemblies in a drawing with numbered balloons that point to individual dimensions and requirements of the part. The numbers on the ballooned drawing matches the numbers in the dimension results data sheets. A Ballooned drawing must be attached in the respective tab of playbook for every submission level when there are dimensional results involved in a PPAP

All Part requirements on the drawings of NCR must be ballooned and numbered for reference and measurement. These may include

i. Dimensions and other geometric tolerances of part
ii. Physical and Mechanical properties (Heat treat Hardness, Plating thickness, Tensile strength, Pull out force, etc.)
iii. Chemical properties (Cure time)
iv. Visual features (Color, texture, flash)
v. Electrical requirements (performance data, functional tests, etc.,)
vi. Any other specified requirement that you have the capability to measure or that is described in the print notes or referenced specifications

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

8.3 Requirement 2: Approved Engineering change document

- This section is used to cover anything not covered in the drawing print such as deviation approvals, emails, feasibility studies, etc.,
- Please note that emails are only for clarification and they do not define any requirements

8.4 Requirement 3: Customer Engineering Approval

- This section is no longer required from our suppliers. In the event it is required in the future, we will inform the suppliers
- Supplier designed part shall have the evidence of Customer Engineering Approval for its performance and functional test

8.5 Requirement 4: Design FMEA

- Design FMEA means Design Failure Modes and Effects Analysis and shows evidence that the potential failures modes and their associated risks have been addressed to eliminate or minimize their effects through product design changes and improvements
- DFMEA is required only when the part is designed by the supplier and should address all the Critical to Quality characteristics (CTQs) and any potential voice of customer inputs identified in NCR project scope
- The date on the DFMEA should show release prior to print release. The severity, Occurrence and detection ratings are used when performing FMEA activities. These rating scales must be compliant with Automotive Industry Action Group (AIAG) guidelines (4th Edition)

8.6 Requirement 5: Process Flow Diagram

- Process Flow Diagrams (PFD) are used to document and clarify all the steps involved in the manufacturing of a part. The Primary process steps must match the process steps addressed in PFMEA and the control plan. Process flow should include the entire manufacturing process flow (receiving through shipping)
- The Process Flow Diagram should include all of the key steps in the process and the offline activities (such as inspection, measurement, handling, etc.). The flow of non-conforming parts such as rework parts, scrap parts should also be included. PFDs can be provided in any format used within the organization.

8.7 Requirement 6: Process Failure Modes and Effects Analysis (PFMEA)

- PFMEA stands for Process Failure Modes and Effects Analysis. This shows evidence that the potential failure modes and the associated risks have been assessed during the manufacturing process design stage to eliminate or minimize their effects on the part/product.
- PFMEA can be submitted in NCR format or any AIAG compliant format
- The recommended rating scale for Severity, Occurrence and Detection are provided in the playbook itself
- Risk Priority Number (RPN) >=125 must have a correction action plan addressing the potential failure mode or potential cause for the failure mode. NCR also recommends any severity ranking 9 or 10 be addressed with a corrective action plan

8.8 Requirement 7: Control Plan

- The Control plan is a document which provides the information on controls that are being established in the process to control the Product and Process characteristics for all the processes involved in the production of the part.
- It is a derivative document of the Process Flow Diagram & PFMEA to address the Process characteristics & the failure modes in the process.

8.9 Requirement 8: Measurement System Analysis Studies (MSA)

The supplier shall have the applicable Measurement System Analysis studies, e.g., Gage R&R for all of the measuring instruments and test equipment that are part of their internal quality system requirements. For PPAP submission, the supplier needs to provide the Gage R&R study report for those instruments that are used for measuring Critical dimensions of the specific part in the actual production environment. Please note that these instruments should have been addressed in the control plan of the respective manufacturing process

9.0 Requirement 9: Dimensional Results

Supplier provides evidence that dimensional verifications required by the design record have been completed and results indicate compliance with specified requirements. Supplier shall record all dimensions (except reference dimensions), characteristics, and specifications as noted on the design record.

We recommend suppliers use the NCR format only for the dimensional results as there are specific Cpk requirements applicable to NCR only.

If production parts are produced from more than one cavity, mold/ tool, Machine supplier shall submit dimensional reports from each cavity.

Definitions of critical dimensions are as below:

1. Critical Dimensions: Identified by an “Obround” in drawings released after Feb 2013 requires 30 sample measurements with Cpk ≥ 1.67 – Refer FIG 3
2. Non Critical Dimension: All other dimensions (Except Reference Dimensions) regardless of the number of decimal places are considered to be Non Critical dimensions and requires 5 samples measurement with no Cpk requirement.

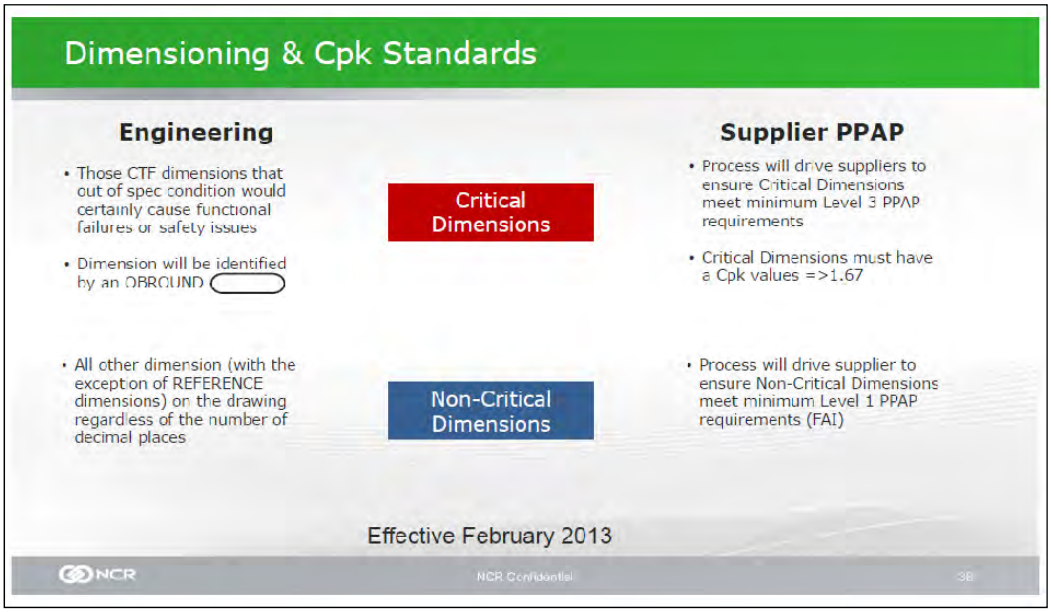


FIG 3

9.1 Requirement10a: Material Test Report

The Material Test Report is where the supplier submits the evidence that they are using the correct Raw material/Grade as per design record. Supplier can submit the Material certificate either by getting one from your Raw material supplier or by doing the certification testing at an outside laboratory.

The Material Test Report is required for all Parent and child level parts wherever design record calls for material specification requirements.

Note:

- Some of the materials specified in the NCR drawing may not available in the supplier's region. An Equivalent Material Document is available for reference/use when this situation occurs. The document number is (009-0028294 – Latest Version).
- We expect the suppliers to use only the approved alternate material as per the above document.
- NCR will not accept any other material without prior approval from NCR Engineering.
- NCR expects the suppliers to call out any Material difference issues and resolve them through the NCR Commodity team. This action should be done through feasibility analysis at the time of part development.
- If the supplier uses any alternate material, the supplier needs to provide the RFC approval reference in the PPAP document while submission to NCR PPAP Team.

UL Certification:

The Supplier needs to provide UL certificate for Plastic parts, Labels, Gaskets and Adhesives used wherever applicable.

9.2 Requirement10b: Performance Test Results:

Performance Test Results are the summary of every test performed on a part. The supplier shall perform tests for all the part(s) or product material(s) when performance or functional requirements are specified in the drawing. It includes ICT, FT, continuity Tests etc. The summary is usually on a form which lists each individual test, when it was performed, the specification, results and the assessment of pass/fail. Performance Test Results may be presented in any convenient format. Attach the "Performance Test results sheet" in the PPAP Playbook.

9.3 Requirement 10c: RoHS Compliance Report

NCR is a RoHS compliant Company. All parts supplied to NCR should be RoHS compliant as per European Union Directive 2011/65/EC or as per NCR Product Environmental Specification – 497-0478705 (Latest Version)

Supplier can provide evidence of RoHS compliance Report in any of the following ways

- Attach RoHS compliance report from the original Raw material supplier
- Attach RoHS Test Lab report either from In-house or Outside laboratory
- Declare RoHS compliance by providing a Certificate of Conformance (COC) in the company letter head with authorized signature.

Note: For the first 2 conditions supplier should provide separate RoHS compliance report for raw material and plating where applicable. For the third condition, a single self-declaration is enough as a whole Part/ Product

9.4 Requirement 10d: Salt Spray Test Report

Salt Spray Test requirement generally applicable for any coated/Plated parts. Supplier needs to provide the evidence of parts meeting the Salt Spray Test requirements as per NCR Plating Specification mentioned in the drawing.

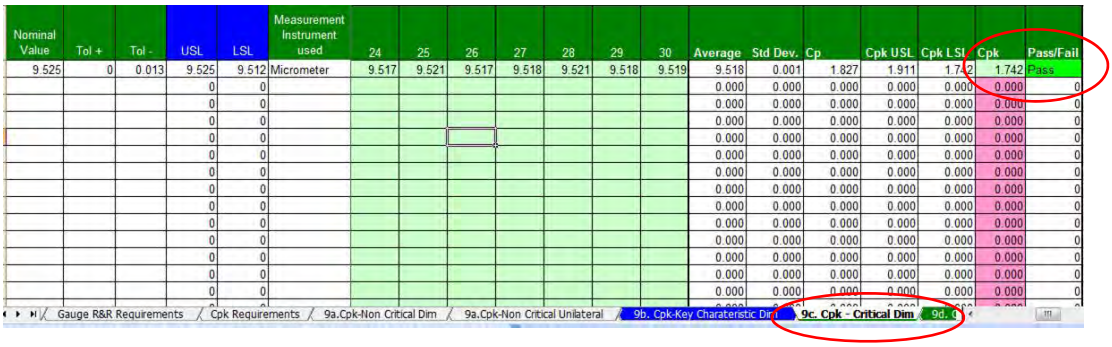
Commonly used plating specifications are listed below.

1. Specification for Alu-Zinc & Galvanized Pre-Plated Steel as per document 009-0024847(Latest Version)
2. Specification for Zinc Plating as per document 009-0020301(Latest Version)
3. Specification for EZ & Organic Pre-coated Steel Sheet as per document 009-0022100(Latest Version)

Suppliers are advised to contact NCR Team to get the above specifications if required.
In addition to the Salt Spray Test Report, coating thickness value for a Minimum of 5 samples need to be measured and reported in "Dimension Report – Non critical dimensions" sheet.

9.5 Requirement 11: Initial Process Studies

- Initial process studies refer to the process performance or process capability studies done for the Critical dimensions during the PPAP parts production.
- Typically automotive and other industries take 125 sample readings for the critical dimension and do the capability analysis.
- NCR's dimension report format ("Dimension Report - Critical dimensions" worksheet of the playbook) covers the initial process study aspect for the PPAP parts.
- It is sufficient to attach above worksheet alone and there is no need to attach separate process study reports in the PPAP documentation. If you have any such separate study report, retain at your end and upon request from NCR, you can submit to NCR
- Please note that Critical dimensions (marked with Obround in the drawing) need to meet minimum Cpk value of 1.67 and for Non-critical dimensions, it should be within specification. If you are not able to meet the required Cpk, please contact your assigned SQE for any technical assistance and ensure Cpk related issues are resolved before submitting the PPAP document to NCR



Nominal Value	Tol +	Tol -	USL	LSL	Measurement Instrument used	24	25	26	27	28	29	30	Average	Std Dev.	Cp	Cpk USL	Cpk LSL	Cpk	Pass/Fail
9.525	0	0.013	9.525	9.512	Micrometer	9.517	9.521	9.517	9.518	9.521	9.518	9.519	9.518	0.001	1.827	1.911	1.742	1.742	Pass

Gauge R&R Requirements | Cpk Requirements | 9a.Cpk-Non Critical Dim | 9a.Cpk-Non Critical Unilateral | 9b. Cpk-Key Charateristic Dim | 9c. Cpk - Critical Dim | 9d.

9.6 Requirement 12: Qualified Laboratory Documentation

Inspection and testing for PPAP shall be performed by a qualified laboratory as defined by customer requirements (e.g., an accredited laboratory). The qualified laboratory (internal or external) shall have a laboratory scope and documentation showing that the laboratory is qualified for the type of measurements or tests conducted.

When an external/commercial laboratory is used, the organization shall submit the test results on the laboratory letterhead or the normal laboratory report format. The name of the laboratory that performed the tests, the date (s) of the tests, and the standards used to run the tests shall be identified.

9.7 Requirement 13: Appearance Report:

Appearance report should contain the part images, Part Marking images, Painting test requirements like Adhesion test report, RAL shade card color confirmation wherever applicable as per NCR drawing and specification requirements.

Supplier needs to measure/Confirm the possible drawing notes in Appearance Report

Part Image Report: Supplier needs to provide relevant image(s) of the part in order to visualize the physical part clearly AND needs to attach the relevant image(s) of markings as specified in drawing notes

Example: Recycle symbol, Part no, UL no, Molders name, Ejection Location etc.

Adhesion Test Results for Painted Parts: Supplier needs to attach the Adhesion Test results for the Painted parts as per below ASTM standard

Adhesion by Tape Test

For Metallic Substrates:

Test in accordance with ASTM D-3359. A rating of 5* using method B is (cross-cut tap test) is required.
*The edges of the cuts are completely smooth; none of the squares of the lattice are detached.

RAL SHADE CARD DETAILS for Painted Parts:

Shade Card – It is a Sample Color chip given by the Paint Manufacturer as per the RAL code of design record and which is used as a reference to cross verify the painted parts

Supplier needs to attach the part image of the painted surface which matches to the shade card

9.8 Requirement 14: Sample Product

Supplier shall submit the PPAP samples to NCR on request.
It is advised to identify the PPAP samples appropriately while sending them to NCR so that those parts can be traced better at NCR for further assembly trials/testing etc

9.9 Requirement 15: Master Sample

It is recommended that supplier retain one or more samples of the PPAP parts at their location with appropriate identification and traceability as per their internal quality system requirements. This will be helpful for any future references.

For any aesthetic or other visual related parts, it is advised that supplier can get necessary approvals through authorized signature on the master samples by their assigned SQE.

(E.g.: Molded parts with accepted level of warpage, shrinkage marks, burr levels in sheet metal parts, any plated or painted parts, AND other visual related elements)

10.0 Requirement 16: Checking Aids

Checking aid refers to the document containing the list of measuring instruments, gauges, equipment's and other fixtures used for qualifying the parts during regular production.

Checking aid should include the calibration status for all the instrument, gages and equipment.

10.1 Requirement 17a: NCR Engineering Approval

Engineering approval refers to formal approval from NCR Engineering team for the parts involved in the PPAP.

Prior to PPAP submission, supplier needs to submit samples of the new part to NCR engineering for validation and other testing. Engineering will provide approval based upon the satisfactory validation & Test results.

During development stage, respective NCR commodity will advise the suppliers on sample size and NCR Engineering location where the parts to be sent for engineering approvals.

The following type of parts will fall under this category but are not limited to - Electronic parts like PCBs, Cables, Harnesses, Sensors, Solenoids, Motors, Locks and catalogue parts like bearings, springs, grease, screws, washers etc.

10.2 Requirement 17b: Sub Supplier Source details as per BOM

Supplier shall provide their sub supplier source details for all the parts listed in BOM

10.3 Requirement 17c: Packaging test report

The Packaging Test Report is where the supplier submits the evidence that they are using the correct packaging to safe transit of the material. Supplier can submit the Packaging test report either by himself by performing test as per ISTA procedure or by doing the certification testing at an outside laboratory.

10.4 Requirement 18: Production Warrant (PW):

Upon completion of all PPAP requirements, supplier shall complete the Production Warrant (PW).
A separate PW shall be completed for each NCR part number for which the PPAP is requested by NCR unless otherwise agreed to by the authorized NCR representative.

The PW is the document through which the supplier confirms and gives assurance that the submitted parts meet all of the specifications, material, appearance and other requirements of NCR and has the capability to meet the NCR requirements consistently

If the supplier is not able to meet any of the NCR requirements, the details of the failure and NCR deviation approval details are to be recorded in the relevant fields of PW.

If the submitted PPAP meets all the necessary requirements, the NCR PPAP team representative will provide approval through authorized signatory in the PW and send the PDF scanned copy of the approved PW to the supplier through ETQ.

Note:

1. PW is one of the Mandatory documents for PPAP submission
2. Supplier should provide their authorized signature in the PW

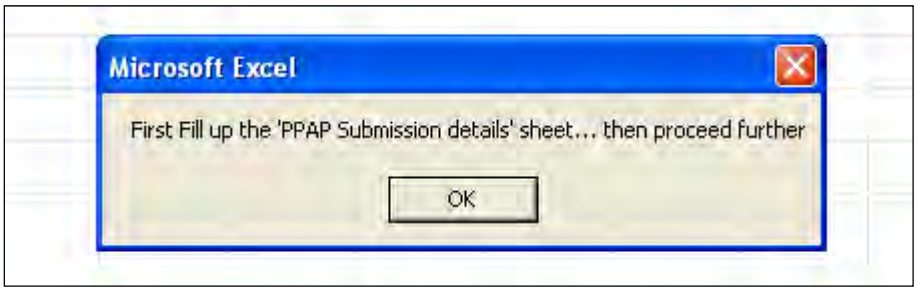
10.5 Requirement 19: Bulk Material Checklist

Not applicable

HOW TO COMPLETE PPAP PLAYBOOK?

Section 1: How to fill out the “PPAP Submission Details”?

Note: This is the First sheet to be filled out in the PPAP Playbook. If this sheet is not filled out, the following error message will appear as pop up. Once completed, the other sheets will be accessible (Except first 4 sheets).



Where supplier needs to fill in the basic information related to the Part and the Manufacturing location. Refer FIG 1

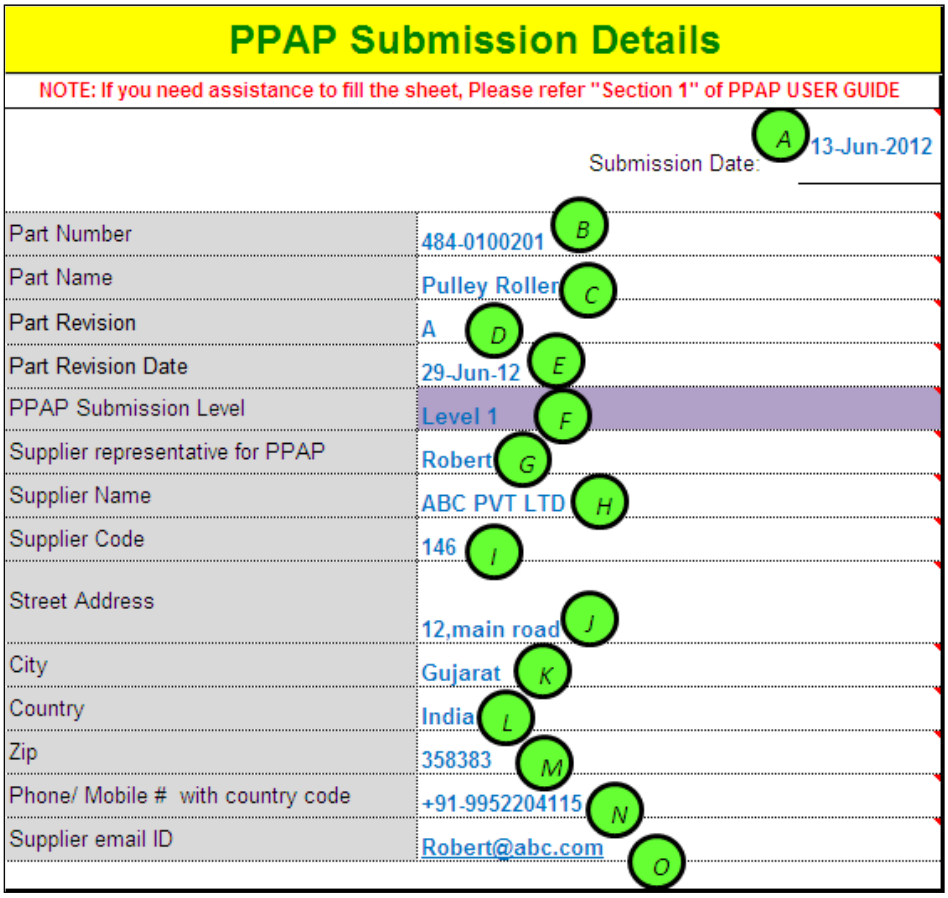


FIG 1

A – Fill in the date of submitting the PPAP (Date Format should be DD-Month-YYYY) E.g. 15-August-2013
B – Fill in the correct Part name Refer FIG 2.

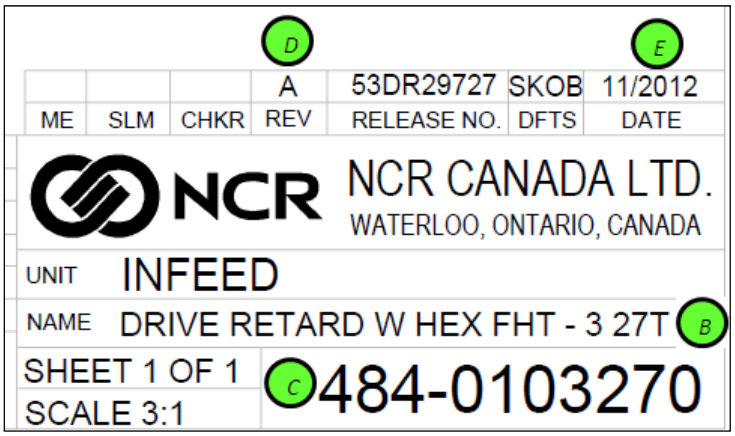


FIG 2

C – Fill in the correct Part#
D – Fill in the correct REV level of the part as per drawing
E – Fill in the drawing released date for the submitted revision
F – Select the PPAP level (Select the Appropriate PPAP level from Drop down menu)
G – Fill in the Supplier representative name
H – Fill in the Supplier name
I – Fill in the Supplier code (NCR Unique code given for each supplier for different location, if supplier is supplying to different NCR location, advised to provide one of the Supplier code) – **Not Mandatory**
J – Fill in the Street address
K – Fill in the City
L – Fill in the country
M – Fill in the Zip code
N – Fill in the phone#
O – Fill in the Supplier email ID

Note: Supplier needs to fill all of the above basic details. Playbook will not allow the supplier to proceed further if any of the fields are Blank. Playbook will pop up the error message as shown in FIG 3 if blanks are detected. The above relevant details will get updated automatically in all other sheets once you enter them here.

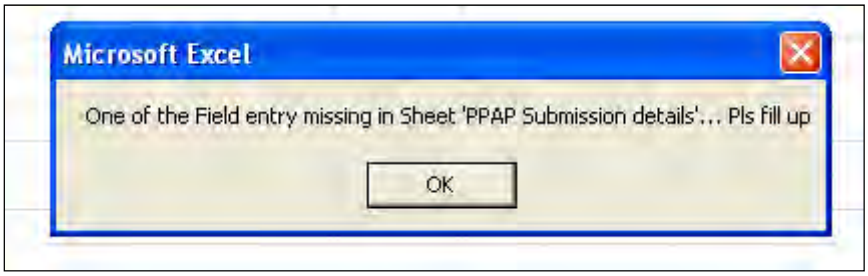


FIG 3

Section 2: How to attach the “Balloon drawing”?

A separate sheet is given in the playbook to attach the balloon drawing. Attachment can be in any readable format like Puff, Tiff, xls etc. You can embed the drawing (FIG 4) or directly attach the drawing to the sheet (FIG 5) as given below

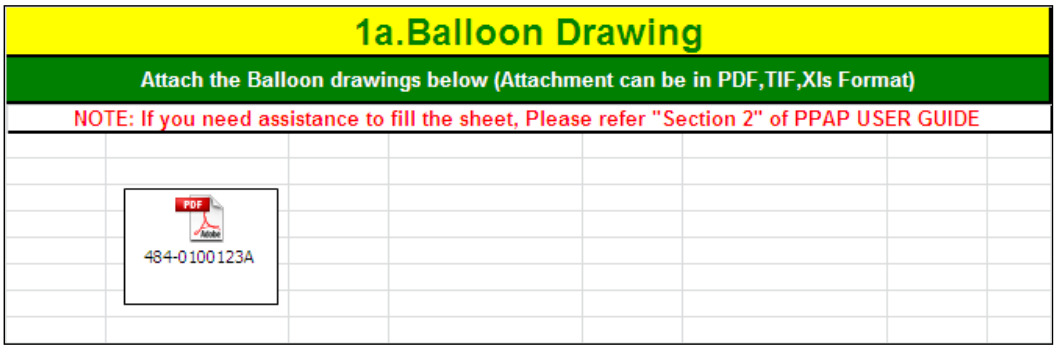


FIG 4

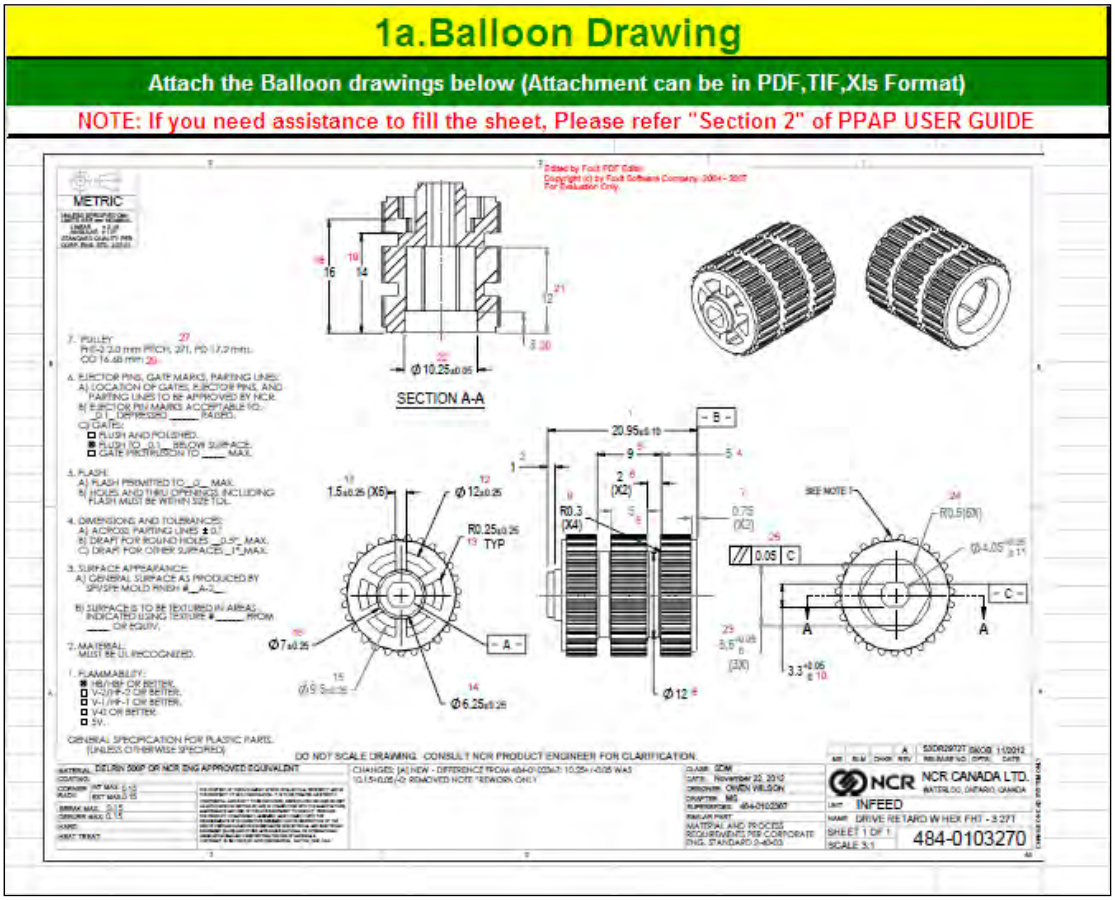


FIG 5

All Part requirements on the drawings of NCR must be ballooned and numbered for reference (FIG 6)

Balloon drawing example:

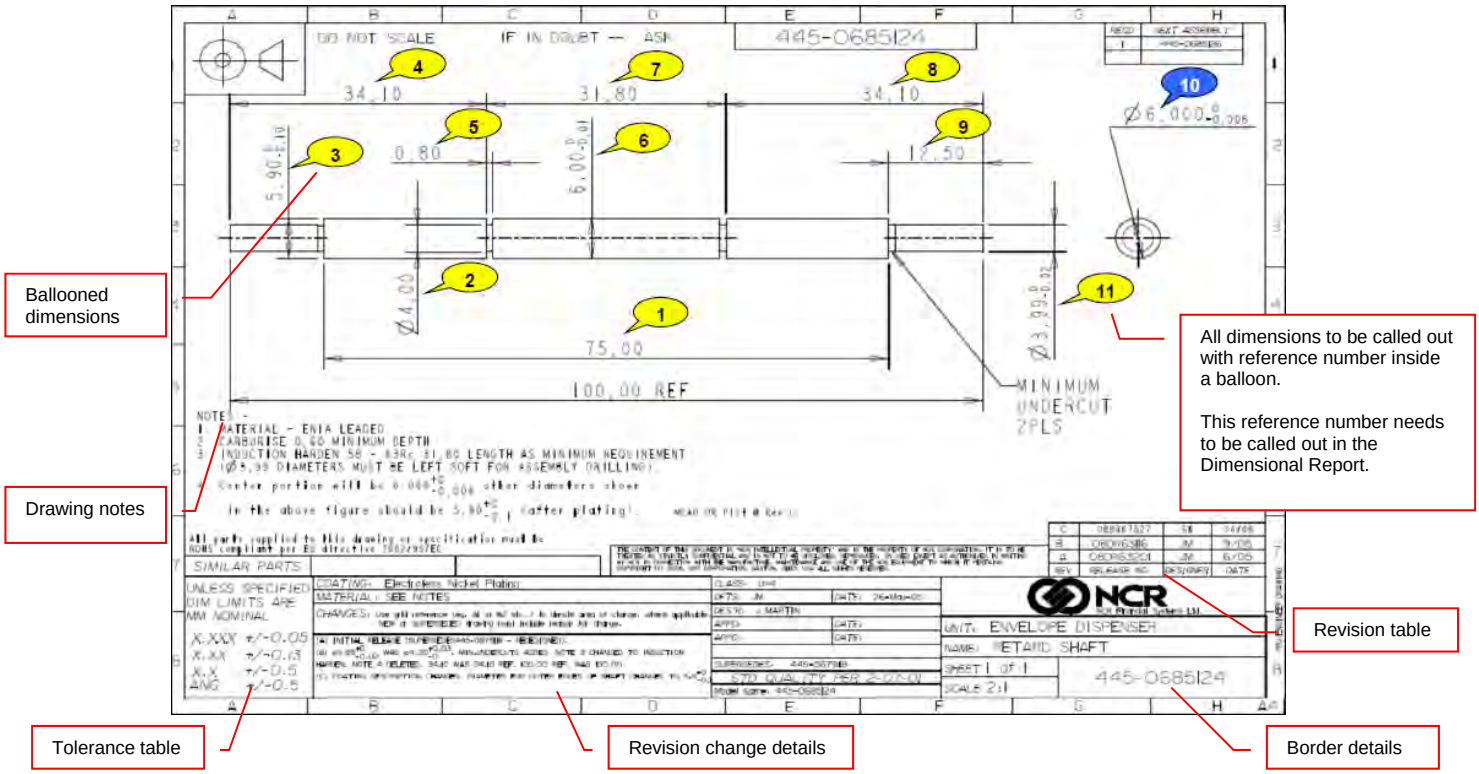


FIG 6

These may include

- Dimensions and other geometric tolerances of part – Refer picture FIG 7 and FIG 8

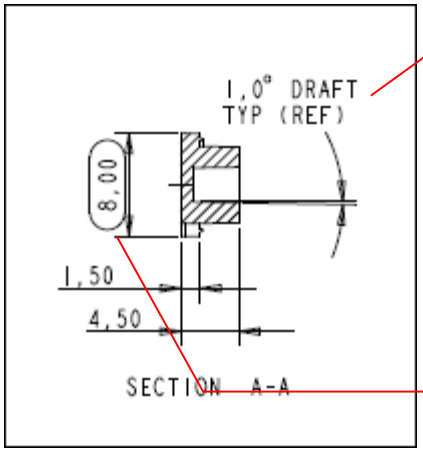


FIG 7

Dimensions marked as '('X' PL) or ('X' x) or (X TYP)' are similar dimensions called in multiple places in the drawing.

In this example – 6 PL means the dimension is occurring in 6 places in the drawing.

All these dimensions to be measured multiple times (E.g.– In this case 2 PL) as specified in the drawing

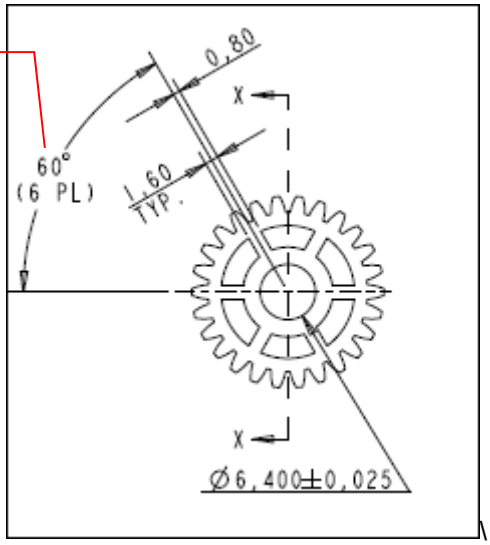


FIG 8

- Drawing notes and specific tabulated details. FIG 9

GEAR DATA	
GEAR TYPE	INVOLUTE SPUR, CLASS D
BASIC RACK TOOTH FORM	BS4582, PART 1, FIGURE 1
NUMBER OF TEETH	26
DIAMETRAL PITCH	32
NORMAL PRESSURE ANGLE	20°
PITCH DIAMETER	20.64
OUTSIDE DIAMETER	22.12 +0/-0.11
WHOLE TOOTH DEPTH	1.91
MEASUREMENT OVER WIRES	22.45 +0/-0.09
WIRE DIAMETER	1.372
TTCE	0.060
TCE	0.100
MAX. INDICATOR READING	-0.012
MIN. INDICATOR READING	-0.150
TOOTH THICKNESS	1.21 +0/-0.04
CHECKING PRESSURE	2.92 - 3.75 Newtons

Gear details in the data table to be verified in the Dimension report.

All measurable data needs to be measured and filled in the Dimensional report.

E.g.:
Outside Diameter, Measurement over Wires, Wire Diameter, TCE, No of Teeth, Tooth Thickness

FIG 9

Drawing notes examples: (FIG 10)

NOTES :---

1, MATERIAL : ACETAL, LNP KL 4010, OR RTP 800 TFE 5 BLACK

2, EJECTOR PIN,GATING LOCATIONS & CORING TO BE APPROVED BY NCR.

3, SURFACE FINISH TO BE SPI/SPE #4 OR BETTER.

4, DRAFT ANGLE TO BE ABSOLUTE MINIMUM.

5, FLASH PERMITTED TO 0,127.

6, USE OF MOULD RELEASE NOT PERMITTED.

All relevant drawing notes needs to be confirmed.
In this example:
Test results to be enclosed for Material specification, Coating specification,

All visual controls like flash, ejector pin location to be captured in Appearance Approval Report,

Measurable parameters like Pull force, Burr level, coating thickness etc., to be entered in the dimension report.

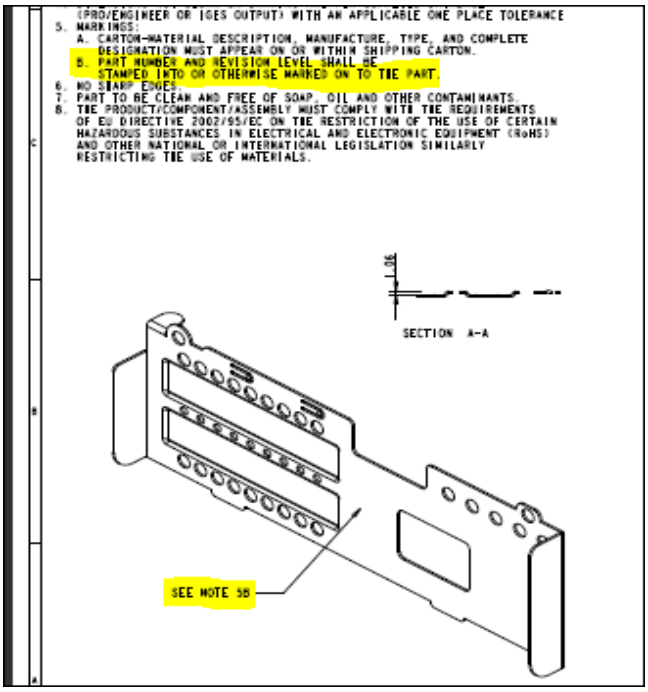
Special operations like Heat treatment process, plating process, etc., needs to be confirmed in the Material test report.

FIG 10

- Physical and Mechanical properties (Heat treat Hardness, Plating thickness, Tensile strength, Pull out force, etc.)
- Visual features (Color, texture, flash)
- Electrical requirements (performance data, functional tests, etc.,)

Points to remember:

- Dimension tolerances to be considered in the following order only:
    1. Tolerance specified along with the dimension
    2. Tolerance given in the notes or table (if none)
    3. General tolerance specified in the border notes
- Start the Balloon sequence from the Left corner A1 grid and complete the numbering sequence in clockwise direction.
- For sheet metal part thickness, if no tolerance is specified along with the dimension then we need to consider sheet metal manufacture tolerance only. Refer to sheet metal manufacture specification sheet and call out the tolerance in the dimension report.
- If cavity number marking / any logos / Part number stamping are specified in the drawing, then a clear image of the part showing the specified detail needs to be attached in the Appearance Approval Report.



Section 3: How to fill out the “Process Flow Diagram”?

What is it?

A visual diagram of the entire process from receiving through shipping including outside processes and services

Objective or Purpose
To help people “see” the real process. Process maps can be used to understand the following characteristics of a process:

- Step-by-step process linkage
- Offline activities (measurement, inspection, handling)
- Rework, scrap. Refer FIG 11

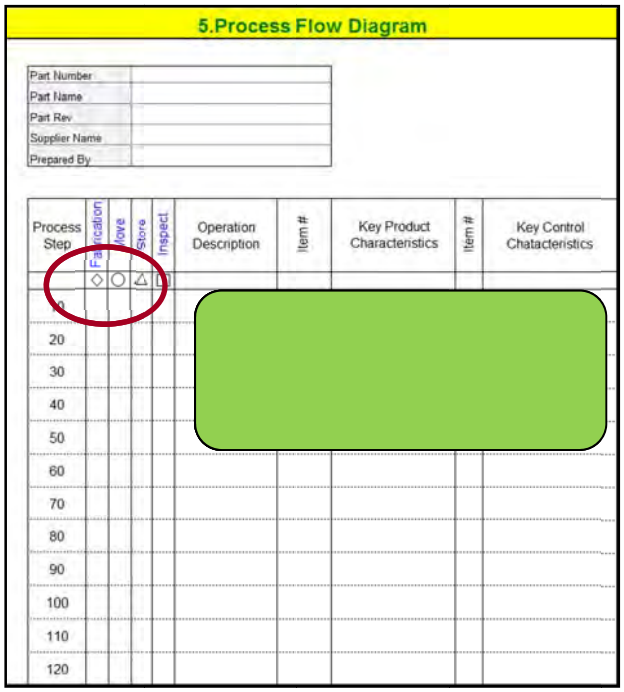


FIG 11

Step 1

Write down the part manufacturing process sequence in Column “Operation Description” Step 1a.as shown in FIG 12 and highlight the relevant symbol as per Process sequence and establish linkage Step 1b.

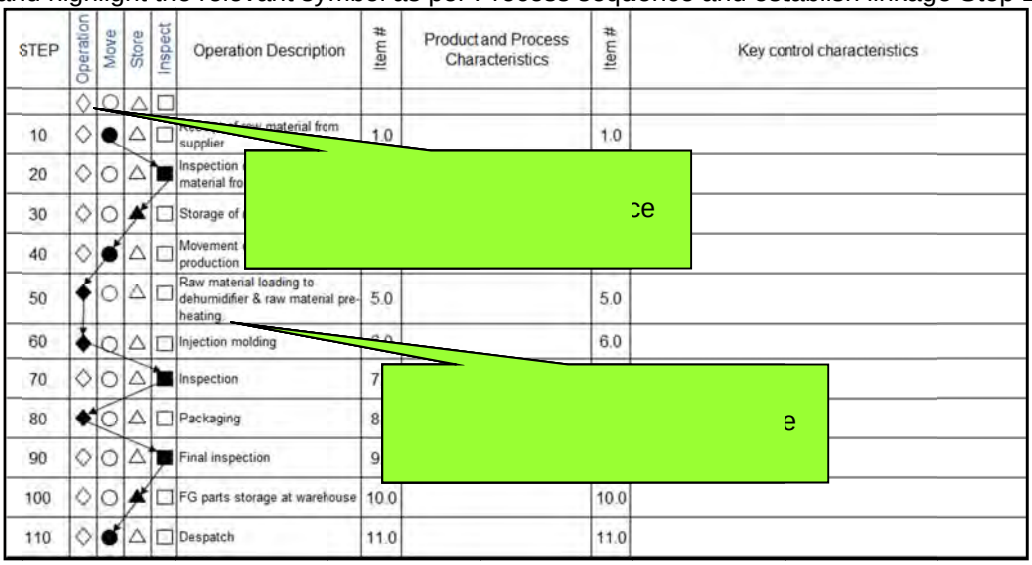
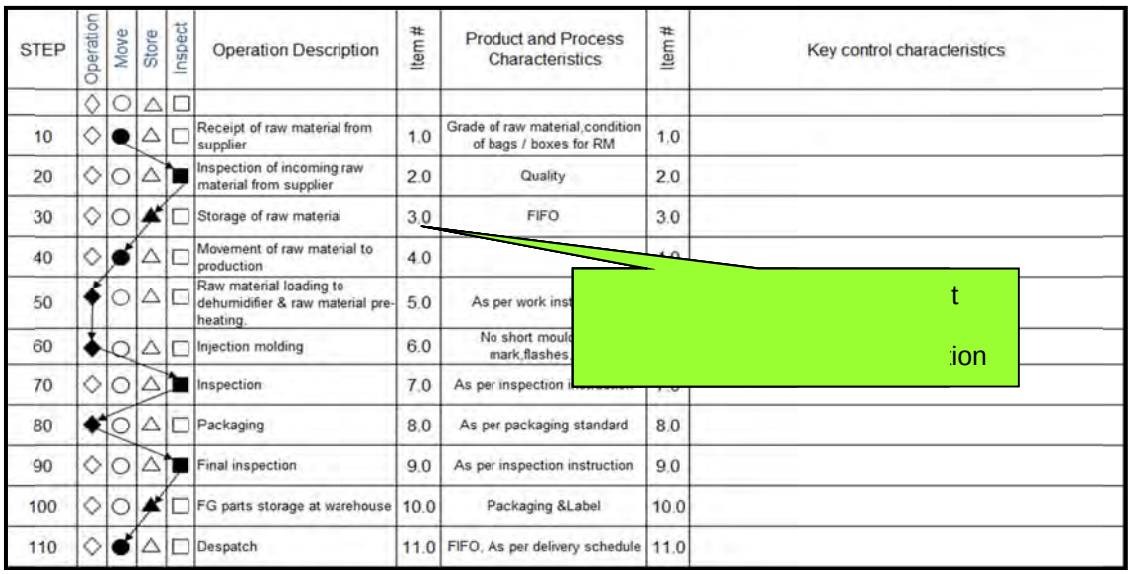


FIG 12

Step 2

List the Product and Process characteristic for each process step in the column “Product and Process characteristics” as shown FIG 13

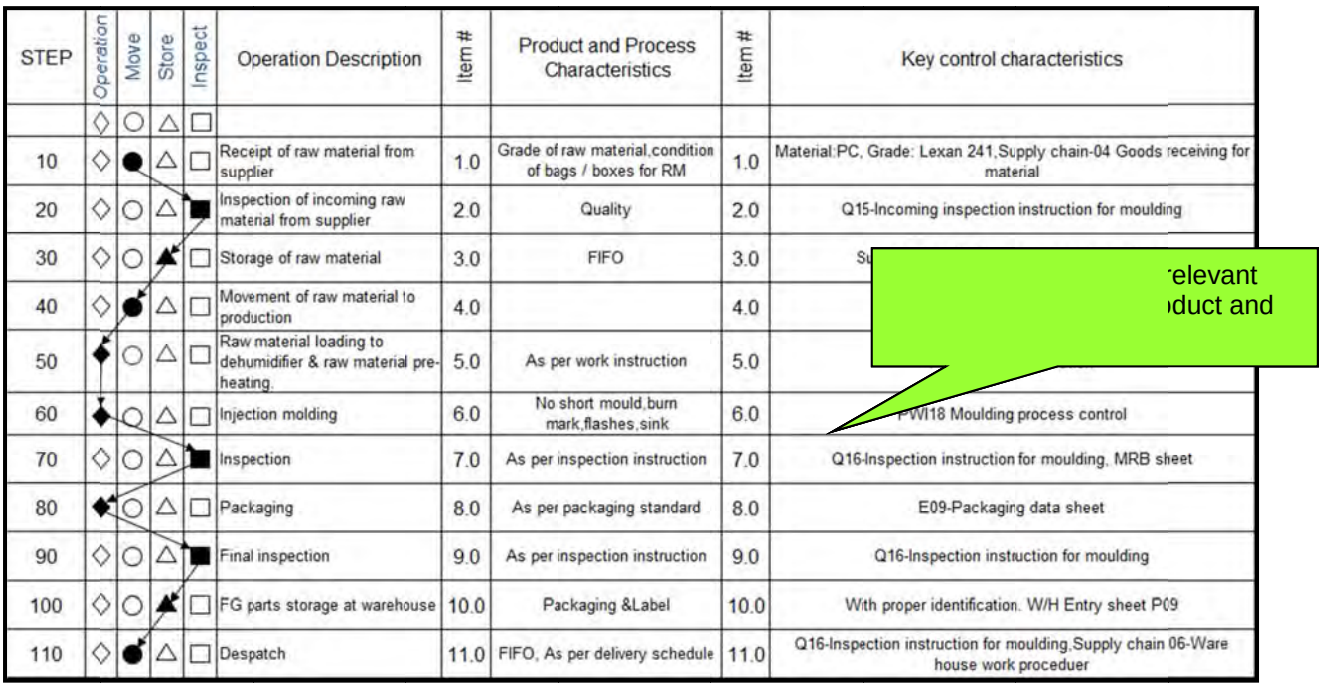


STEP	Operation	Move	Store	Inspect	Operation Description	Item #	Product and Process Characteristics	Item #	Key control characleristics
	◇	○	△	□					
10	◇	●	△	□	Receipt of raw material from supplier	1.0	Grade of raw material,condition of bags / boxes for RM	1.0	
20	◇	○	△	■	Inspection of incoming raw material from supplier	2.0	Quality	2.0	
30	◇	○	▲	□	Storage of raw materia	3.0	FIFO	3.0	
40	◇	●	△	□	Movement of raw material to production	4.0			
50	◆	○	△	□	Raw material loading to dehumidifier & raw material pre-heating.	5.0	As per work inst		
60	◆	○	△	□	Injection molding	6.0	No short mould mark,flashes,		
70	◇	○	△	■	Inspection	7.0	As per inspection i		
80	◆	○	△	□	Packaging	8.0	As per packaging standard	8.0	
90	◇	○	△	■	Final inspection	9.0	As per inspection instruction	9.0	
100	◇	○	▲	□	FG parts storage at warehouse	10.0	Packaging &Label	10.0	
110	◇	●	△	□	Despatch	11.0	FIFO, As per delivery schedule	11.0	

FIG 13

Step 3

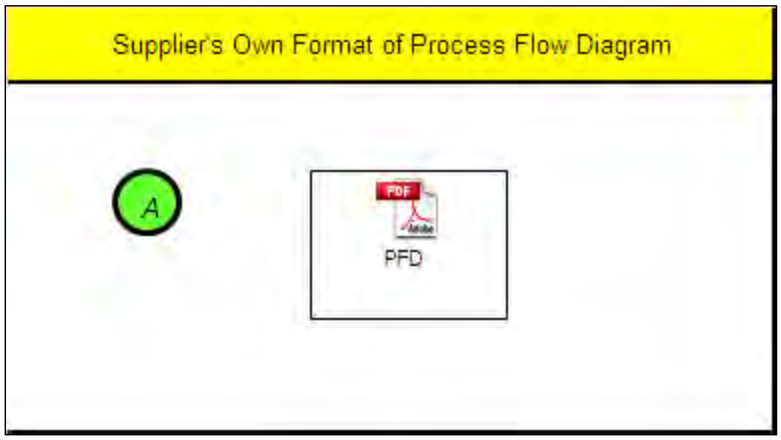
List all the key control characteristics for each product and process characteristics in Column “Key Control Characteristics” as shown in FIG 14



STEP	Operation	Move	Store	Inspect	Operation Description	Item #	Product and Process Characteristics	Item #	Key control characteristics
	◇	○	△	□					
10	◇	●	△	□	Receipt of raw material from supplier	1.0	Grade of raw material,condition of bags / boxes for RM	1.0	Material:PC, Grade: Lexan 241,Supply chain-04 Goods receiving for material
20	◇	○	△	■	Inspection of incoming raw material from supplier	2.0	Quality	2.0	Q15-Incoming inspection instruction for moulding
30	◇	○	▲	□	Storage of raw material	3.0	FIFO	3.0	
40	◇	●	△	□	Movement of raw material to production	4.0		4.0	
50	◆	○	△	□	Raw material loading to dehumidifier & raw material pre-heating.	5.0	As per work instruction	5.0	
60	◆	○	△	□	Injection molding	6.0	No short mould,burn mark,flashes,sink	6.0	PWI18 Moulding process control
70	◇	○	△	■	Inspection	7.0	As per inspection instruction	7.0	Q16-Inspection instruction for moulding, MRB sheet
80	◆	○	△	□	Packaging	8.0	As per packaging standard	8.0	E09-Packagirg data sheet
90	◇	○	△	■	Final inspection	9.0	As per inspection instruction	9.0	Q16-Inspection instruction for moulding
100	◇	○	▲	□	FG parts storage at warehouse	10.0	Packaging &Label	10.0	With proper identification. W/H Entry sheet P09
110	◇	●	△	□	Despatch	11.0	FIFO, As per delivery schedule	11.0	Q16-Inspection instruction for moulding,Supply chain 06-Ware house work proceduer

FIG 14

Note: Suppliers can attach their own Process Flow Diagram Format in the space provided in the Process Flow Diagram sheet as given below. Attachment can be in any readable format such as PDF, Xls, and TIF etc.



A – Attach the Process Flow Diagram

Section 4: How to fill out the "Process Failure Modes and Effects Analysis (PFMEA)" sheet?

Objective

- A tool used to identify and prioritize risk areas and their mitigation plans
- Identifies potential failure modes, causes, and effects.
- Inputs come from the process flow diagram.
- Identifies key inputs which positively or negatively affect quality, reliability and safety of a product or process.

When to develop PFMEA

- After completion of the process flow diagram.
- Prior to tooling for production
- PFMEA Format Refer FIG 15

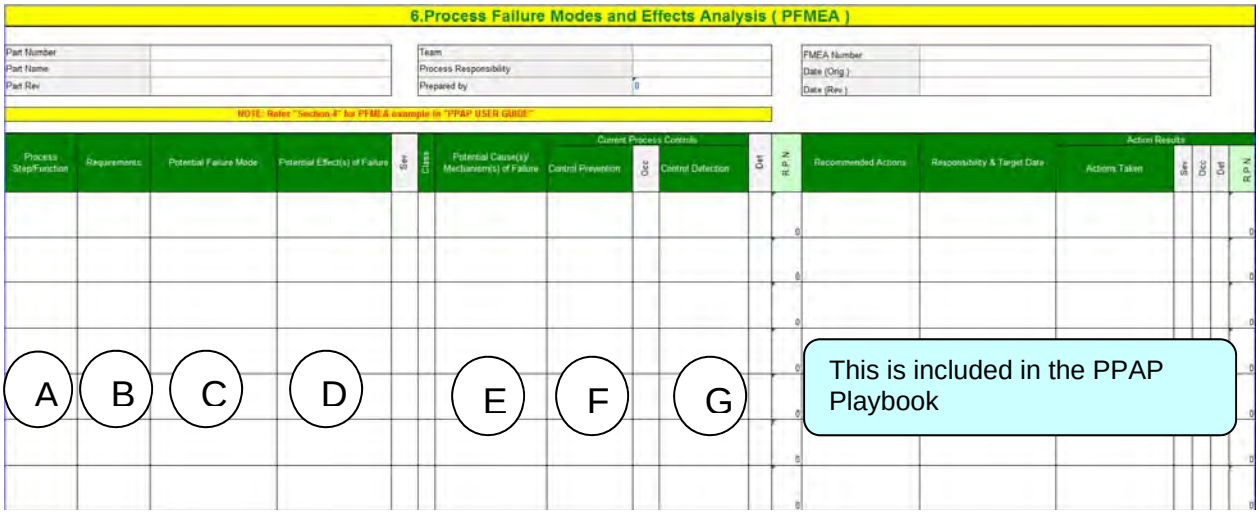


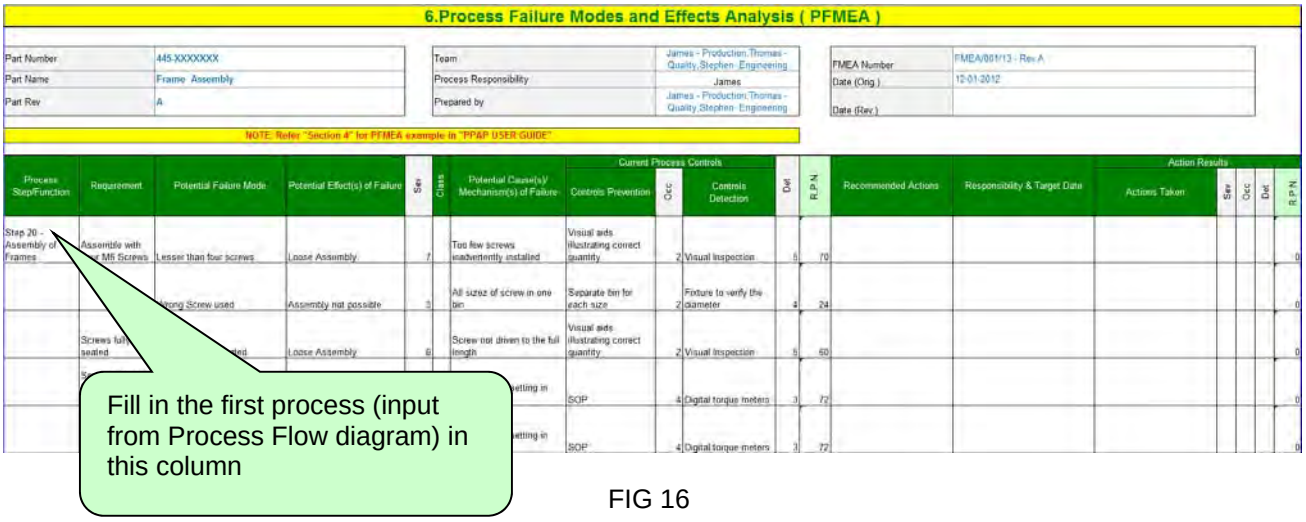
FIG 15

IMPORTANT: PFMEA TO BE DEVELOPED BY CROSS FUNCTION TEAM COMPRISING MEMBERS FROM PRODUCTION, QUALITY, AND ENGINEERING

Note: Suppliers can attach their own PFMEA Format in the space provided in the PFMEA sheet. Format should satisfy AIAG requirement. Attachment can be in any readable format such as PDF, XIs, and TIF etc.

☞ STEP 1

Write down the Process step Description as per Process Flow diagram in Column A – Refer FIG 16

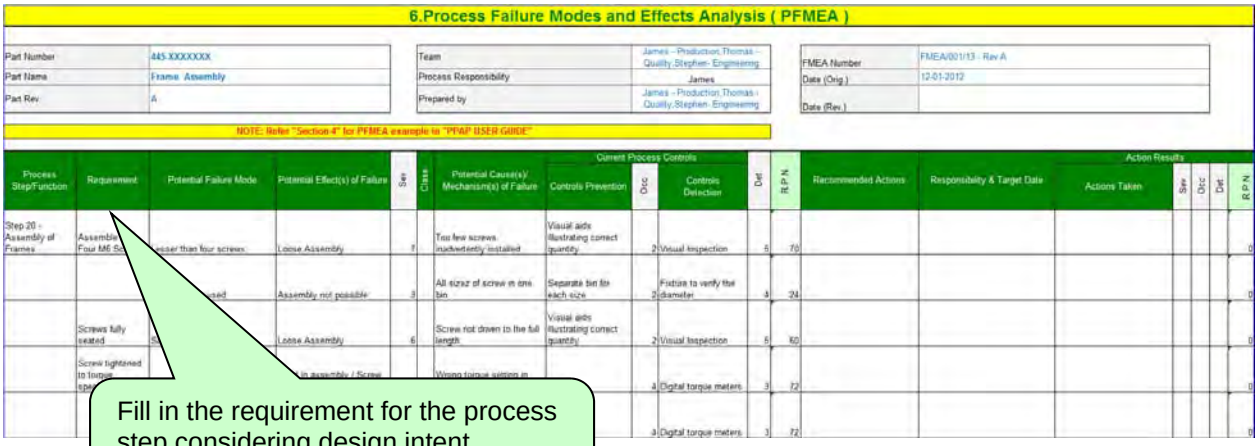


Fill in the first process (input from Process Flow diagram) in this column

FIG 16

☞ STEP 2

Write down the requirement for the Process Step / Function in Column B – Refer FIG 17



Fill in the requirement for the process step considering design intent /customer requirement

FIG 17

☞ STEP 3

Write down the Potential failure mode for the process in Column C – Refer FIG 18

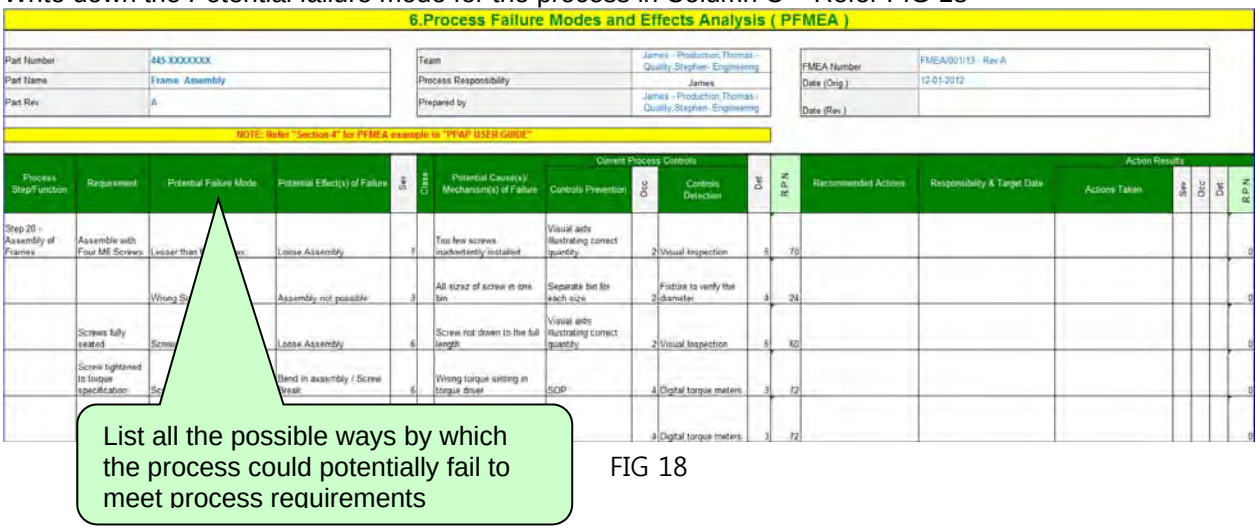


FIG 18

☞ STEP 4

Write down the Potential effect of Failure for the Failure Mode in Column D – Refer FIG 19

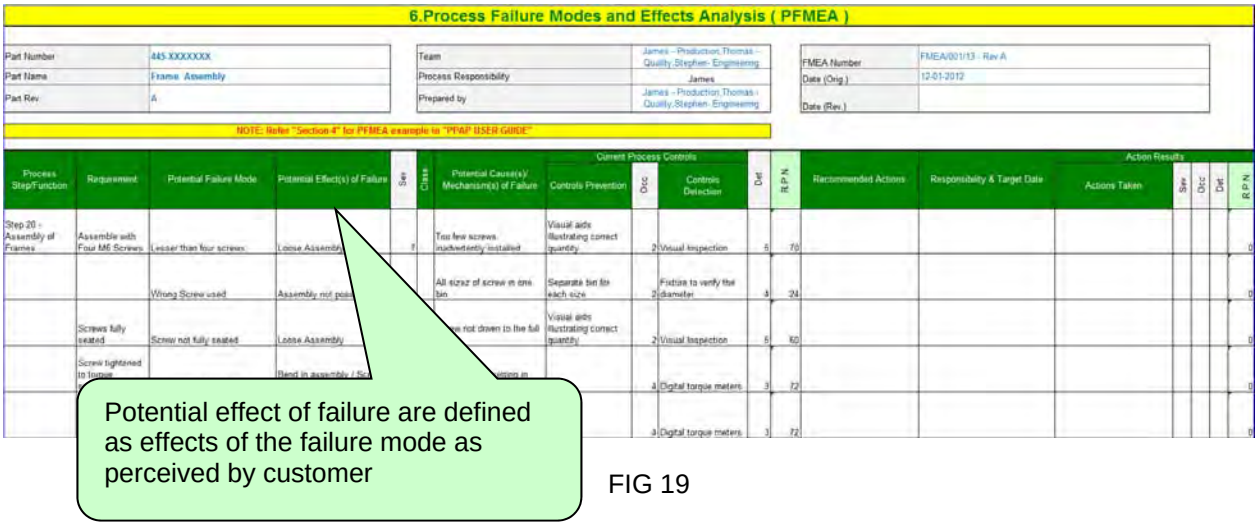


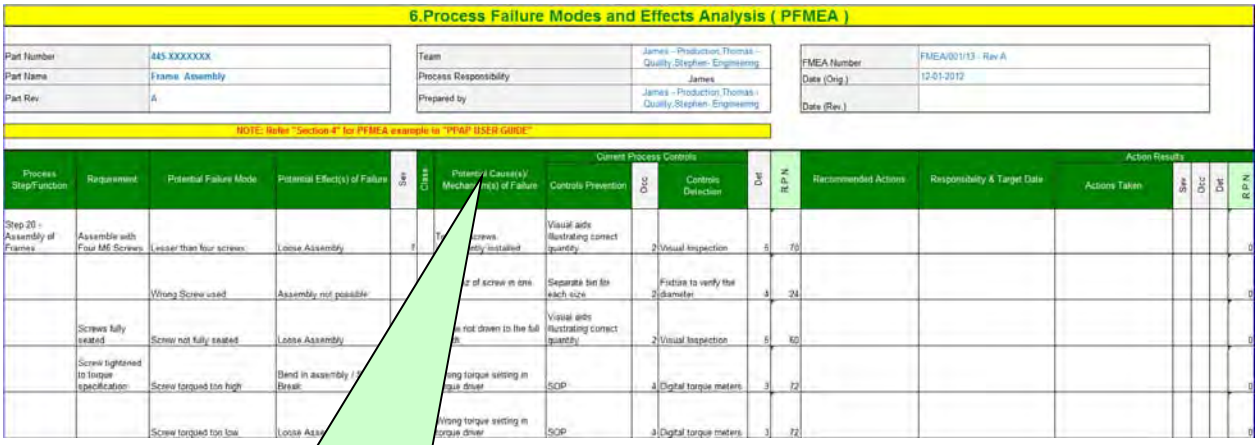
FIG 19

To determine the Possible effects, the following to be questioned

- Does the Potential Failure mode physically prevent next process or cause potential harm to equipment /operators?
- What is the potential impact at End User?
- What would happen if an effect was detected before reaching customer?

☞ STEP 5

Write down the Potential Cause of the Failure in Column G – Refer FIG 20

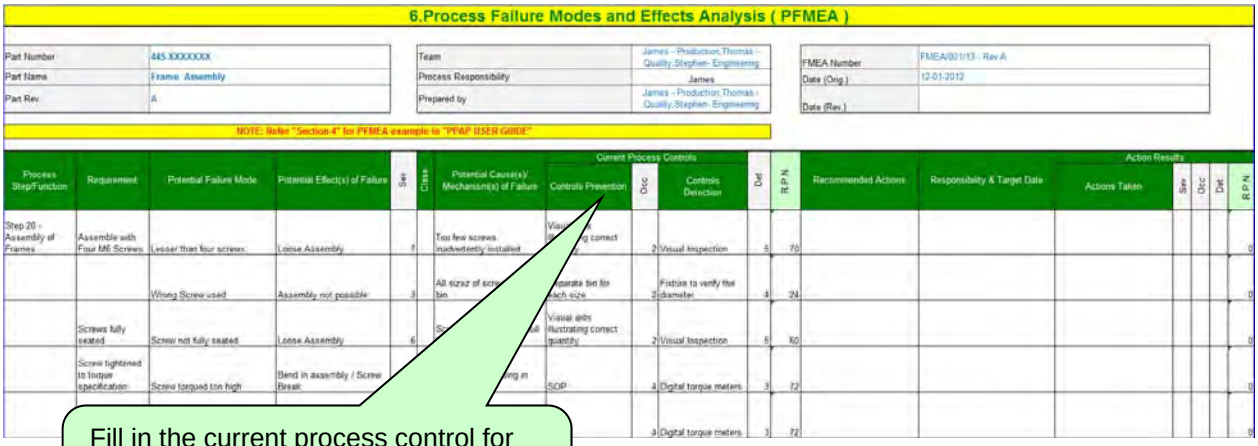


Potential cause of failure is defined as an indication how the failure can occur

FIG 20

☞ STEP 6

Write down the current process control for the potential failure in Column H & J – FIG 21



Fill in the current process control for the potential failure to prevent or detect the possible cause

FIG 21

☞ STEP 7

Assign SEVERITY, OCCURRENCE, DETECTION ratings – Refer FIG 22

SEVERITY: It is the value associated with the most serious effect for a failure mode.
(Refer Table for Severity also for criteria guidelines)

OCCURRENCE: It is the likelihood that a specific cause of failure will occur
Estimate the likelihood of occurrence of a potential cause of failure on a 1 to 10 Scale (Refer Table for Occurrence for criteria guidelines)

DETECTION: It is the rank associated with the best detection control listed in the detection control table
(Refer Table for Detection for criteria guidelines)

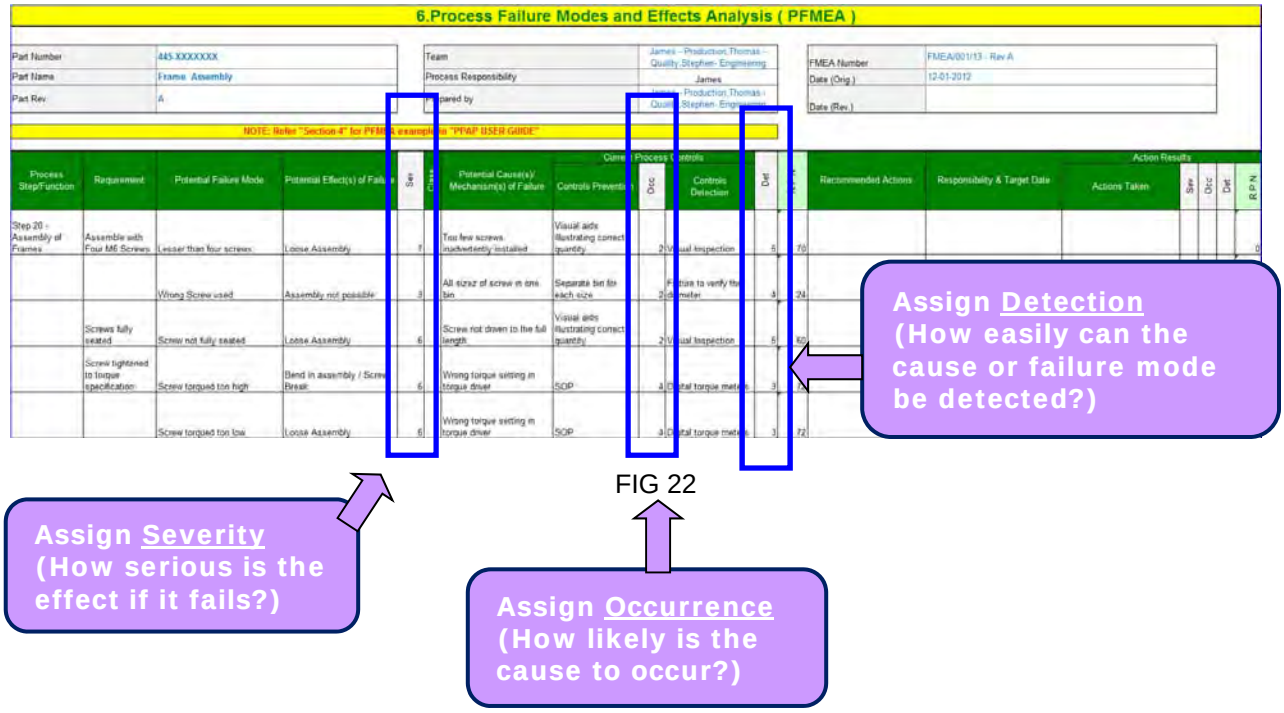


FIG 22

☞ STEP 8

Calculate Risk Priority Number (RPN) and record the values – Refer FIG 23

RPN = Severity X Occurrence X Detection

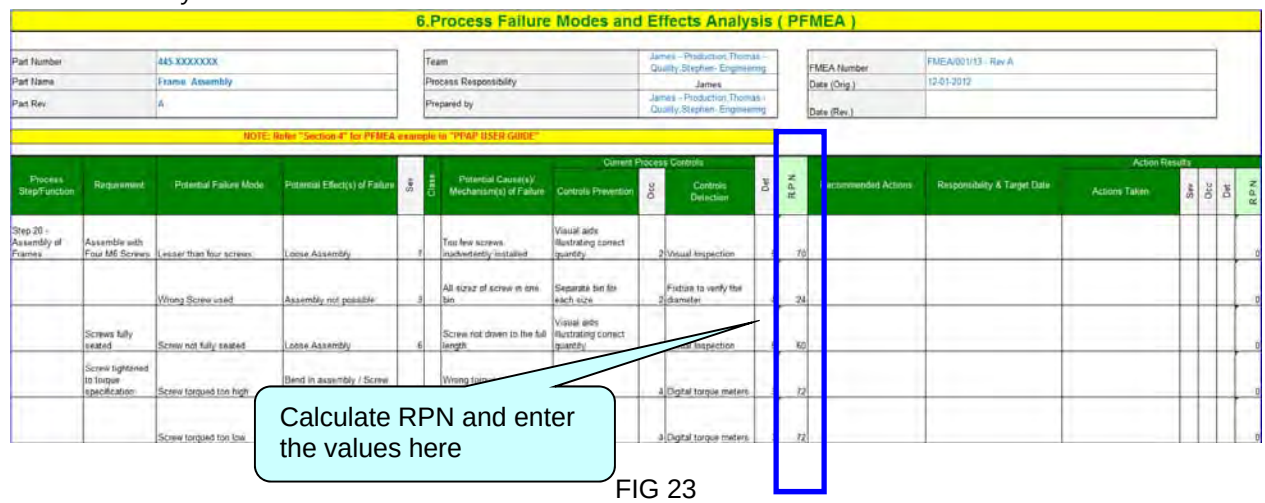


FIG 23

POINTS TO NOTE

- **The RPN is used to prioritize the most critical risks identified in the first half of the FMEA.**
- **High RPNs (125 or above) are flags to take effort to reduce the calculated risk.**
- **Regardless of RPN, *high Severity* scores (9 or 10) should be given special attention.**

Severity Scale Rating

Table Cr1 Suggested PFMEA Severity Evaluation Criteria				
Effect	**Criteria: Severity of effect on product (customer effect)**	**Rank**	**Effect**	**Criteria: Severity of effect on product (Manufacturing /assembly effect)**
Failure to Meet safety and/or Requlatity Requirement	Potential failure mode affects safe vehicle operation and /or involves noncompliance with government regulation without warning	10	**Failure to meet Safety and/or Regulatory Requirements**	May endanger operator (machine or assembly) with out warning
	Potential failure mode affects safe vehicle operation and /or involves noncompliance with government regulation without warning	9		May endanger operator (machine or assembly) with out warning
Loss or Degradation of Primary Function	Loss of primary function (vehicle inoperable, does not affect safe vehicle operation)	8	**Major Disruption**	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	**Significant Disruption**	A portion of the production run may have to be scrapped. Deviation from primary process including decreased line speed or added man power.
Loss or Degradation of Secondary Function	Loss of secondary function (vehicle operable, but comfort/convenience functions inoperable)	6	**Moderate Disruption**	100% of production run may have to be reworked off line and accepted
	Degradation of secondary function (vehicle operable, but comfort/convenience functions at reduced level of performance).	5		A portion of production run may have to be reworked offline and accepted
Annoyance	Appearance or Audible noise, vehicle operable, item does not conform and noticed by most customers(>75%)	4	**Moderate Disruption**	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 customers(>50%)	3		A portion of the 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 customers(>25%)	2	**Minor Disruption**	Slight inconvenience to process, operation, or operator.
No effect	No discernible effect	1	**No Effect**	No discernible effect

FIG 24

Occurrence Scale Rating

Probability of Failure	**Criteria :Occurence of Cause - PFMEA (Incidents per Items/product)**		**Rank**
Very High	>= 100 Per thousand >=1 in 10		10
	50 per thousand 1 in 20		9
	20 per thousand 1 in 50		8
High	10 per thousand 1 in 100		7
	2 per thousand 1 in 500		6
	.5 per thousand 1 in 2000		5
Moderate	.1 per thousand 1 in 10000		4
	.01 per thousand 1 in 100000		3
Low	<=.001 per thousand 1 in 1000000		2
Very Low	Failure is eliminated through preventive control		1

FIG 25

Detection Scale Rating

TABLE FOR DETECTION			
Opportunity for Detection	**Criteria: Likelihood of Detection by process control**	**Rank**	**Likelihood of Detection**
No Detection opportunity	No current process control; Cannot detect or is not analyzed	10	Almost Impossible
Not likely to detect at any stage	Failure Mode and/or Error (Cause) is not easily detected.(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 through use of attribute gauging (go/no go, manual torque check/clicker wrench, etc.).	7	Very Low
Problem Detection Post Processing	Failure Mode detection post - processing by operator through use of variable gauging or in-station by operator through use of attribute gauging (go/no-go, manual torque check/clicker wrench, etc).	6	Low
Problem Detection at Source	Failure Mode or Error (Cause) detection in-station by operator through use of varaible gauging or by automoted controls in-station that will detect discrepant part and notify operator (light, buzzer, etc). Gauging performed on setup and first-piece check	5	Moderate
Problem Detection Post Processing	Failure Mode detection post-processing by automated controls that will detect discrepant part and lock part 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 not 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.

FIG 26

☞ STEP 9

Analyzing the FMEA

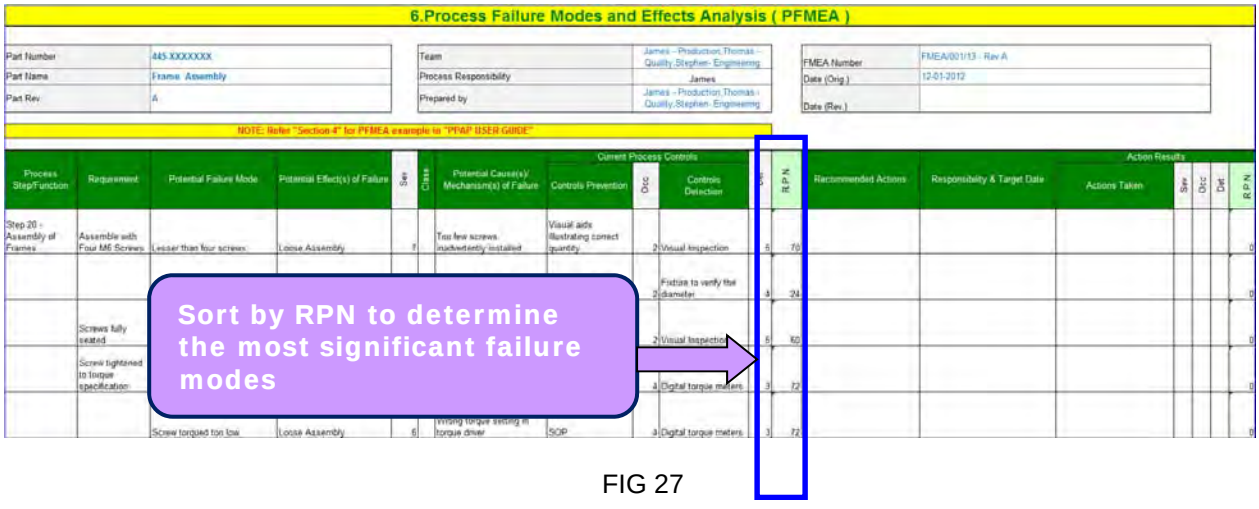


FIG 27

- Once the RPN Numbers are determined, they can be used to prioritize the most significant failure modes.
- Sort the FMEA by the RPN numbers. Graphical and statistical

Point to remember – RPN Thresholds

- When using an RPN threshold, DO NOT forget to address high *Severity* scores

Severity – can only be improved by a design change to the product or process

Occurrence – can only be reduced by a change which removes or controls a cause. Examples are redundancy, substituting a more reliable component or function or mistake-proofing.

Detection – can be reduced by improving detection. Examples are mistake-proofing, simplification and statistically sound monitoring.

In general, reducing the Occurrence is preferable to improve the Detection

☞ STEP 10

- **Determine Actions Recommended to reduce High RPNs**

Process Step	Potential Failure Mode	Potential Effect(s) of Failure	R.P.N.	Recommended Actions	Responsibility & Target Date	Action Results				
						Actions Taken	Sev	Occ	Det	R.P.N.
Op 70: Manual application of wax inside door panel	Insufficient wax coverage over specified surface	Allows integrity breach of inner door panel	280	Add positive depth stop to sprayer	Mfg. Eng. By 5/10/10	Stop added, sprayer checked on-line	7	2	5	70
		Corroded interior lower door		Automate spraying	Mfg. Eng. By 5/25/10	Rejected due to complexity of different doors on the same line				
		riorated life to: Unsatisfactory appearance due to rust through paint over time - Impaired function of interior door hardware	175	Use DOE on viscosity vs. temp vs. pressure	Mfg. Eng. By 5/31/10	Temp and press limits were determined and limit controls have been installed - Control charts show process is in control Cpk = 1.85	7	1	5	35

For the high RPN numbers, determine the recommended actions.

FIG 28

☞ STEP 11

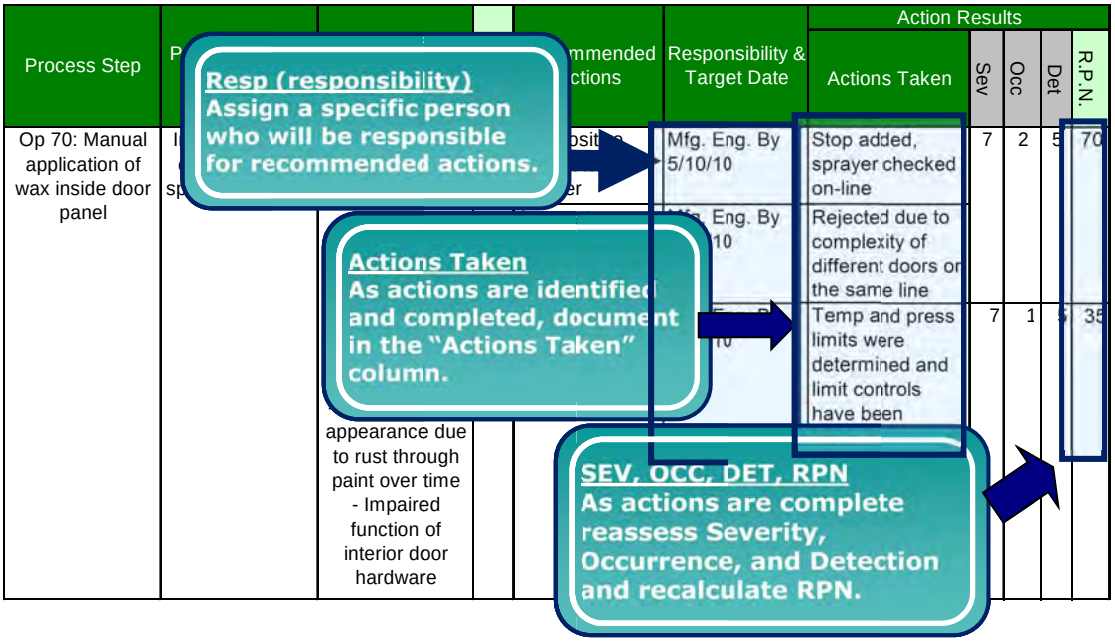


FIG 29

- Now recalculate your RPNs based on mitigation plans
- Continue updating the actions taken and resulting RPNs until all risks are at an acceptable level (below 125).

Points to Remember

1. For each Process Input, determine the ways in which the Process Step can go wrong (these are Failure Modes).
2. For each Failure Mode associated with the inputs, determine Effects on the outputs.
3. Identify potential Causes of each Failure Mode.
4. List the Current Controls for each Cause.
5. Assign Severity, Occurrence and Detection ratings after creating a ratings key appropriate for your project.
6. Calculate RPN.
7. Determine Recommended Actions to reduce High RPNs.
8. Take appropriate Actions and Document.
9. Recalculate RPNs.
10. Revisit steps 7 and 8 until all the significant RPNs have been addressed.

Section 5: How to fill out the "Control Plan" sheet?

- The Control Plan is a document which provides the information on various controls that is being established in the process to control the Product and Process characteristics of all the processes involved in the production of the part.
- It is a derivative document of the Process Flow Diagram & PFMEA to address the Process characteristics & the failure modes in the process.

A typical control plan of the Play book is shown in FIG 30:

Control Plan

☐ Prototype ☐ Pre-Launch ☑ Production

Control Plan Number CP_NC16MLD2005-00-B		Team Windy.Wen, Tang Kaven, Tim Chen, Fisher Zou, Chen Phil, Ronnie Luo	Date (Org.) 16-05-2012 / Date (Rev.) 16-05-2012
Part Number/Latest Change Level 484-0470120 A		Supplier/Plant Approval/Date Tim Chen 2012-5-9	Customer Engineering Approval/Date (If Req'd.)
Part Name/Description Idler pulley		Other Approval/Date (If Req'd.)	Customer Quality Approval/Date(If Req'd.)
Supplier/Plant Rosti Integrated Manufacturing Solutions (Suzhou) Co., Ltd. / Supplier Code 261			Other Approval/Date (If Req'd.)

Part/Process Number	Process Name/Operation Description	Machine, Device, Jig, Tools, for MFG	Characteristics: No.	Product	Process	Special Char. Class	Methods: Product/Process Specification/ Tolerance	Evaluation/Measurement Technique	Responsibility	Sample: Size	Sample: Freq.	Control Method	Reaction Plan
10	IQC		1	Raw material	Packing		Related to specific II.	visual	IQC	1 times	every batch	incoming inspection report	feedback supplier MRB
			2		quantity,color, appearance refer to master sample		Related to specific II.			1 times	every batch		
20	stock	fork lift	1		Keep the package complete and sealed without any damage,open, wet,etc			visual	warehouseman	100%	1 Lot	rolling check list	feedback supplier MRB
30	transport	fork lift	1		1.keep the package complete without any damage,open, etc 2.transfer the correct material to production line		1.5S 2.picking list	visual	warehouseman	100%	1 Lot	1.5S scoring 2.picking list	1.replace material 2.re-transfer correct material
40	Dry material	drier	1	correct part number	1.temperature,time 2.clean the drier		1.pack list 2. 80degree，4hours 3.refer to silicon free production WI	visual	technician	1 time	very bag every work order every shift	drier check list	replace material adjust drying parameter MRB
50	Molding	Moulding machine	1	Mold setup	Mold Preparation Mold NO:SZ2005		As per Work Order	visual	technician	1 time	start up	Work Order	Adjust process parameters correct tool
			2		Parameter input	Parameter input	1.PW81-moulding process contro 2.PW18-MOULD 1ST OFF SAMPLE WORK INSTRUCTION 3.SETTING SHEET	visual	technician	100%	every shift	P02 Process History Sheet	feedback to supervisor and project team
			1	Production	appearance		Molding Working instruction	visual	technician	100%	every shift	P02 Process History Sheet	Adjust process parameters MRB
			2		Dimension 4.500+/-0.05 2.275+0.05 2.075+0.1	Dimension control	Setting sheet	VMM	technician	One time	every shift		Adjust process parameters MRB
60	Inprocess-inspection 过程检验		1	Setup inspection	Dimension 4.500+/-0.05 2.275+0.05 2.075+0.1		Inspection instruction	VMM	IPQC	3pcs/Lot	every time	inspection report	feedback to technician MRB
			2		apperance should be ok: without defect(deform,shortage,no release agent, burnt mark, scartch, damage, gate mark, etc)		1.Master sample 2.Inspection instruction	visual	IPQC	3pcs/Lot	every time	inspection report	feedback to technician MRB
			3		apperance:Surface finish of Mold		1.Master sample	visual	IPQC	100%	every time	inspection report	feedback to technician MRB
			1	Inprocess-inspection	Dimension 4.500+/-0.05 2.275+0.05 2.075+0.1		Inspection instruction	VMM	IPQC	5shots/2hours X-R chart(SPC)	Process audit	inspection report	feedback to technician MRB
			2		apperance should be ok: without defect(deform,shortage,no release agent, burnt mark, scartch, damage, gate mark, etc)		1.Master sample	visual	IPQC	5shots/2hours	Process audit	inspection report	Adjust process parameters MRB
			3		Apperance:Surface finish of Mold		1.Master sample	visual	IPQC	5shots/2hours	Process audit	inspection report	Adjust process parameters MRB
70	package		1		1=products without damage,deform,wet,etc. 2=correct quantity and part number 3=Carton without damage 4=Correct plastic carton	Stick label on carton as soon as one carton packed		packing data sheet inspection instruction	Visual	Operator	1 time	every carton		improve package when next packaging
			2			wear gloves, use PE bag to pack in PE bag in silicon free area, then seal them, finaly pack to carton, and stick silicon free table on box		silicon free WI	Visual check	warehouseman	1 time	every carton	training and quality once half year	Feedback to project team MRB

FIG 30

Note: Suppliers can attach their own Control Plan Format in the space provided in the Control Plan sheet. Format should satisfy AIAG requirement. Attachment can be in any readable format such as PDF, XIs, and TIF etc.

Control Plan explanation: - Refer FIG 31 and FIG 32

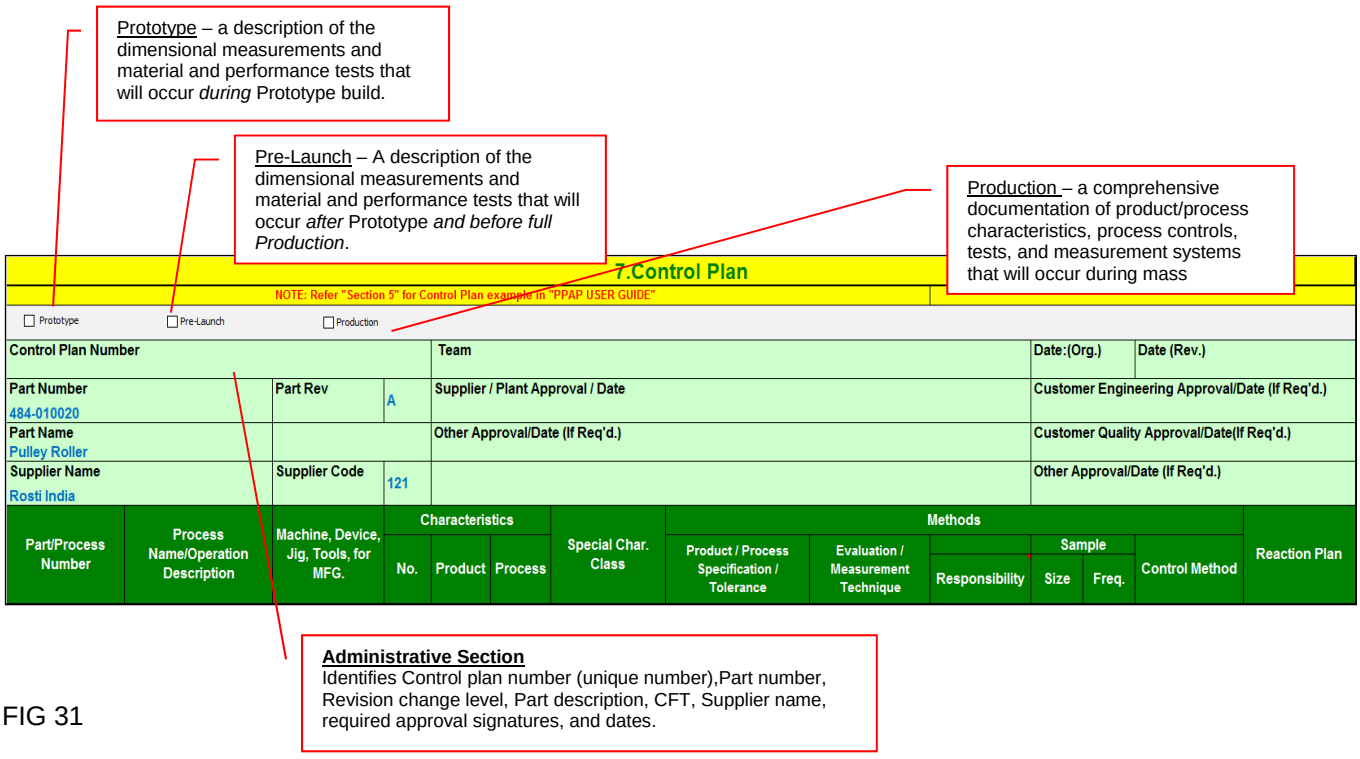
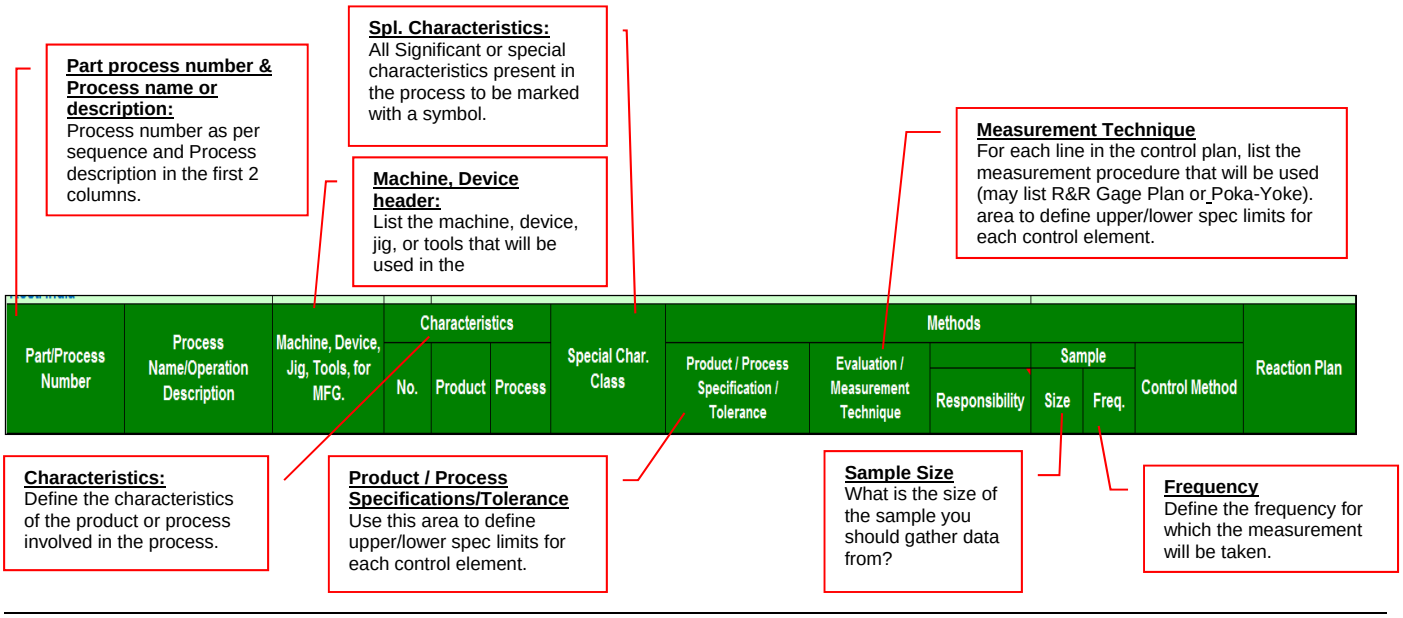


FIG 31



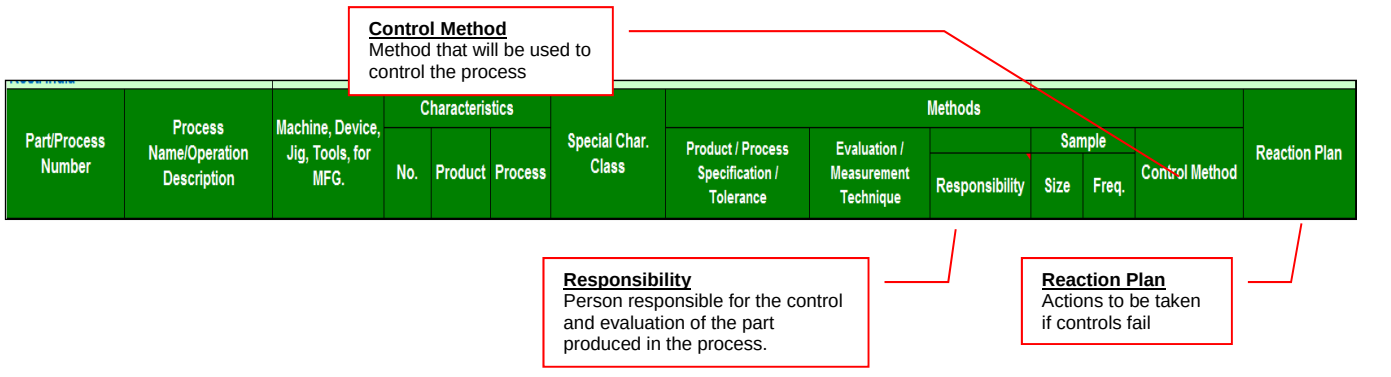
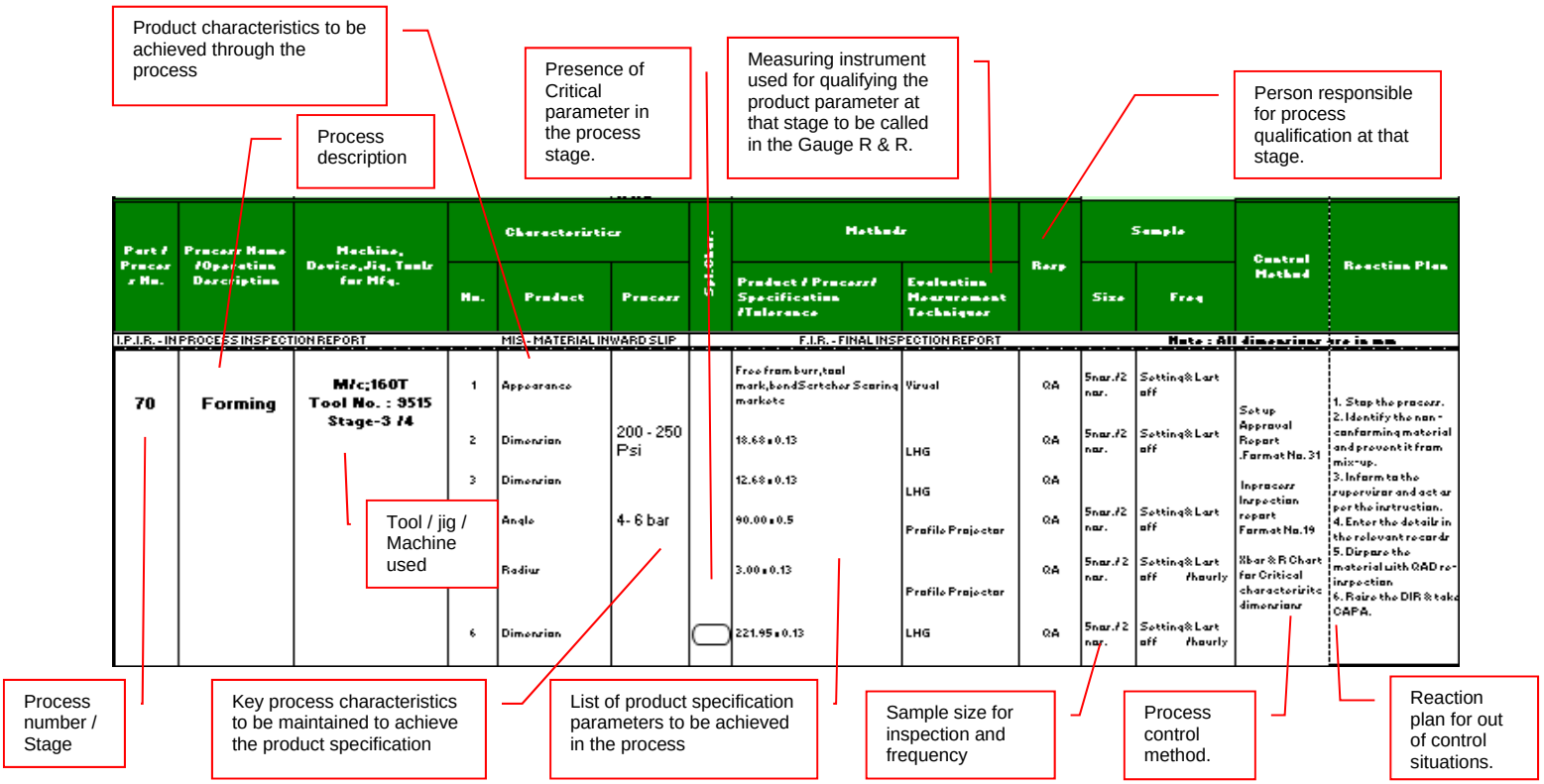


FIG 32

Control plan – Example: - Refer FIG 33



Part / Process No.	Process Name /Operation Description	Machine, Device, Jig, Tools for Mfg.	Characteristics No.	Product	Process	Spl. Char.	Methods Product / Process / Specification /Tolerance	Evaluation Measurement Technique	Resp	Sample Size	Sample Freq	Control Method	Reaction Plan
I.P.I.R. - IN PROCESS INSPECTION REPORT			MIS - MATERIAL INWARD SLIP				F.I.R. - FINAL INSPECTION REPORT					Note : All dimensions are in mm	
70	Forming	M/c;160T Tool No. : 9515 Stage-3 /4	1	Appearance			Free from burr, tool mark, bend Scratches Scoring marks etc	Visual	QA	5nos./2 nos.	Setting & 1st off	Set up Approval Report .Format No. 31	1. Stop the process. 2. Identify the non - conforming material and prevent it from mix-up. 3. Inform to the supervisor and act as per the instruction. 4. Enter the details in the relevant record 5. Dispose the material with QAD re-inspection 6. Raise the DIR & take CAPA.
			2	Dimension	200 - 250 Psi		18.68 ± 0.13	LHG	QA	5nos./2 nos.	Setting & 1st off		
			3	Dimension			12.68 ± 0.13	LHG	QA				
				Angle	4- 6 bar		90.00 ± 0.5	Profile Projector	QA	5nos./2 nos.	Setting & 1st off	In process Inspection report Format No.19	
				Radius			3.00 ± 0.13	Profile Projector	QA	5nos./2 nos.	Setting & 1st off /hourly	Xbar & R Chart for Critical characteristic dimensions	
			6	Dimension			221.95 ± 0.13	LHG	QA	5nos./2 nos.	Setting & 1st off /hourly		

FIG 33

Note:

It is recommended to have Statistical Process control for all critical dimensions mentioned in the drawing. The same needs to be mentioned in the control method of the control plan.
Example: X bar- R chart, X bar – S chart and other suitable control charts as applicable

Section 6: How to fill out the “Gage R&R study”?

Repeatability & Reproducibility

Repeatability is the variation in measurements obtained with one measurement instrument when used several times by an appraiser while measuring the identical characteristic on the same part and commonly known as equipment variation (EV).

Reproducibility is the variation in the average of measurements made by different appraisers using the same instrument when measuring the identical characteristic on the same part and commonly known as appraiser variation (AV).

Note: Suppliers can attach their own R & R study report in Gage R & R sheet

Variable MSA – Gage R & R study

Prerequisite for Gage R & R study

- Select 10 parts that represent the full range of process variation
- Identify the parts with indelible ink
- Identify the appraisers - (Persons qualifying the part)
- Calibrate the gage before Gage R & R study

MSA Parameters

- (3) Operators
- (3) Trials
- (10) Samples

Thumb rule for Selection of Instrument:
Capable to measure 1/10th of the part tolerance

Step 1

Use the R & R Spread sheet from PPAP Play book (in Excel form) – Refer FIG 34

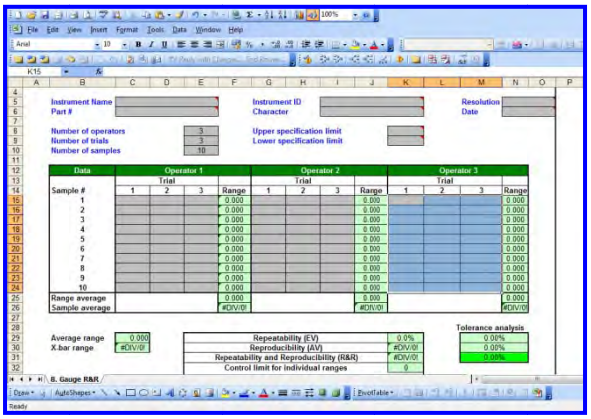


FIG 34

Step 2

Enter Instrument name, Instrument ID and Resolution of the instrument in the areas marked – Refer FIG 35

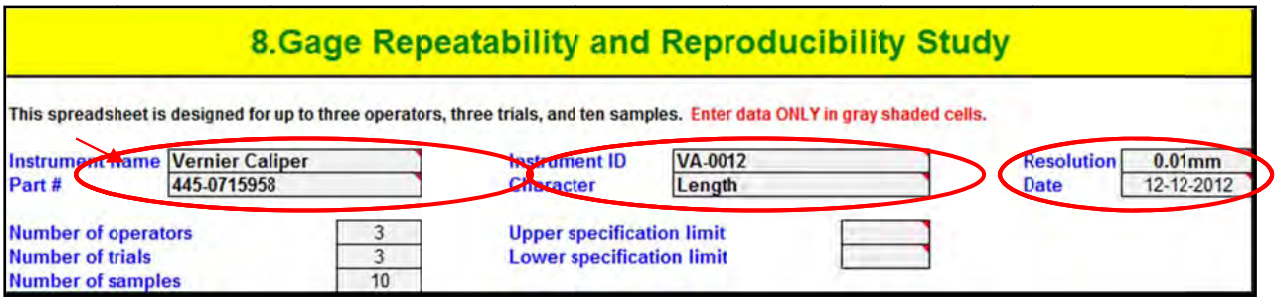


FIG 35

Enter number of operators as “3”
Enter no of trails as “3”
Enter number of samples as “10”
Refer FIG 36

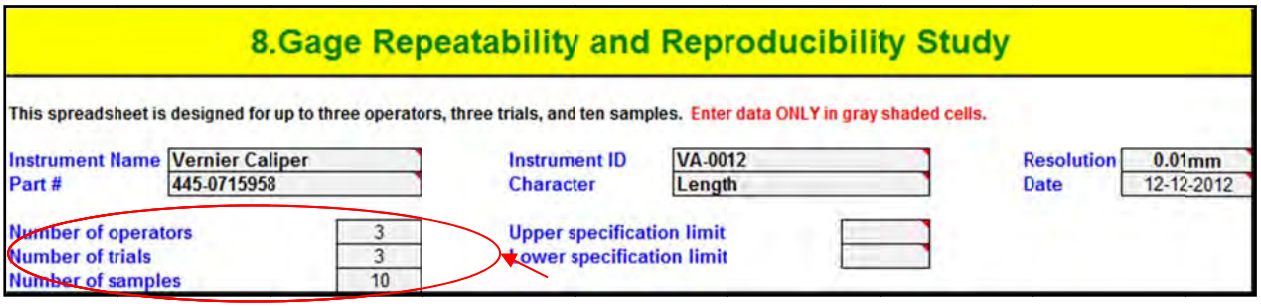


FIG 36

Step 4

Enter Upper specification limit and lower specification limit in the areas marked – Refer FIG 37

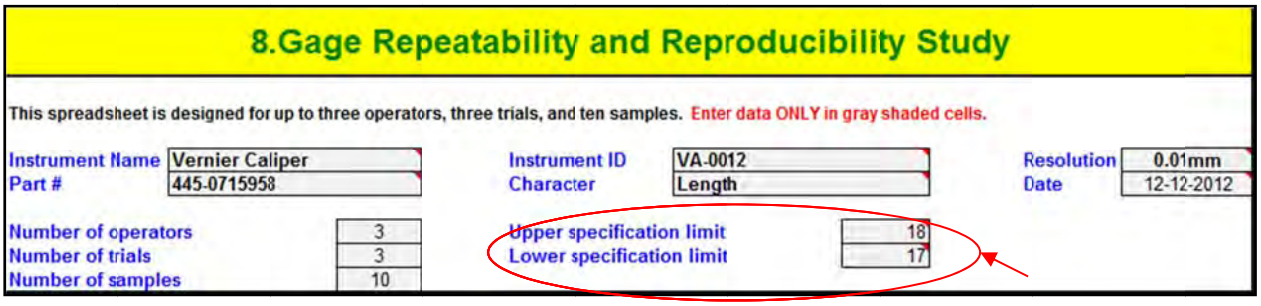
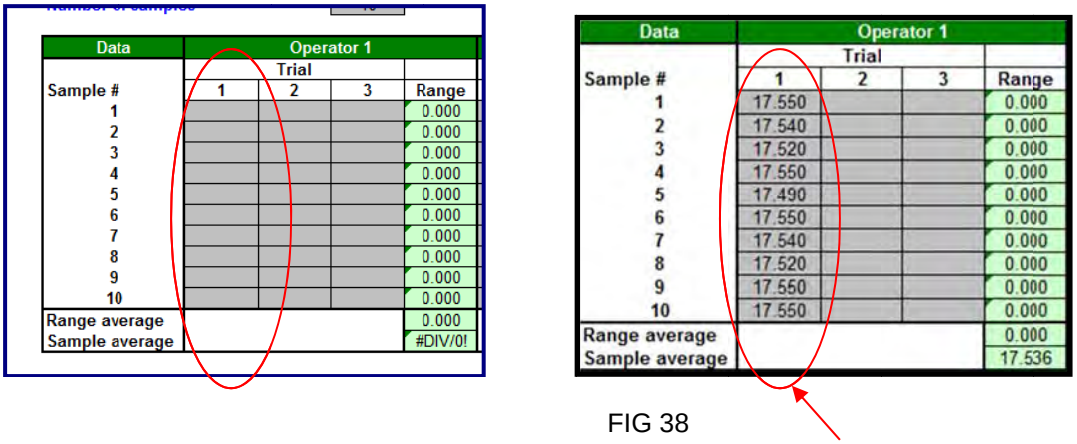


FIG 37

Step 5

Enter the measured values of “First Trail” of Operator 1 as shown – Refer FIG 38

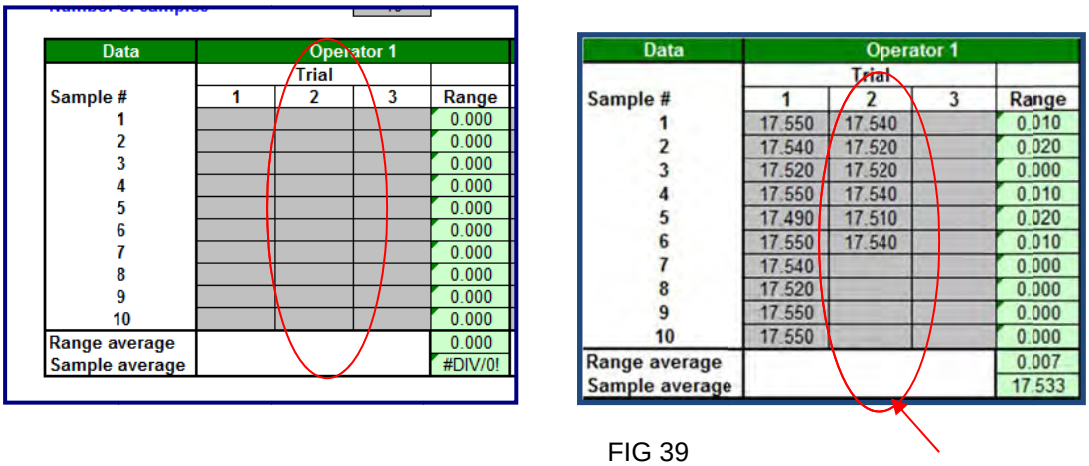


Data	Operator 1			
	Trial			
Sample #	1	2	3	Range
1				0.000
2				0.000
3				0.000
4				0.000
5				0.000
6				0.000
7				0.000
8				0.000
9				0.000
10				0.000
Range average				0.000
Sample average				#DIV/0!

Data	Operator 1			
	Trial			
Sample #	1	2	3	Range
1	17.550			0.000
2	17.540			0.000
3	17.520			0.000
4	17.550			0.000
5	17.490			0.000
6	17.550			0.000
7	17.540			0.000
8	17.520			0.000
9	17.550			0.000
10	17.550			0.000
Range average				0.000
Sample average				17.536

FIG 38

Enter the measured values of “Second Trail” of Operator as shown in FIG 39

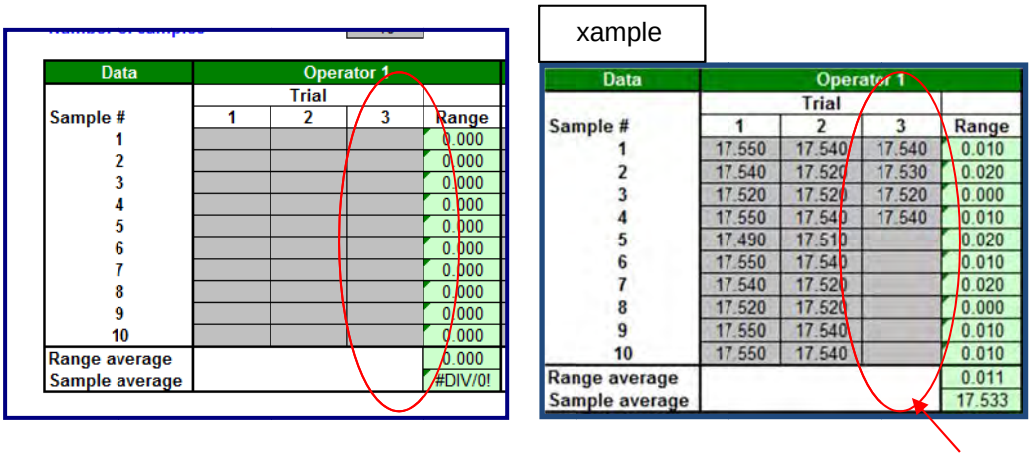


Data	Operator 1			
	Trial			
Sample #	1	2	3	Range
1				0.000
2				0.000
3				0.000
4				0.000
5				0.000
6				0.000
7				0.000
8				0.000
9				0.000
10				0.000
Range average				0.000
Sample average				#DIV/0!

Data	Operator 1			
	Trial			
Sample #	1	2	3	Range
1	17.550	17.540		0.010
2	17.540	17.520		0.020
3	17.520	17.520		0.000
4	17.550	17.540		0.010
5	17.490	17.510		0.020
6	17.550	17.540		0.010
7	17.540			0.000
8	17.520			0.000
9	17.550			0.000
10	17.550			0.000
Range average				0.007
Sample average				17.533

FIG 39

Enter the measured values of “Third Trail” of Operator 1 as shown in FIG 40



xample

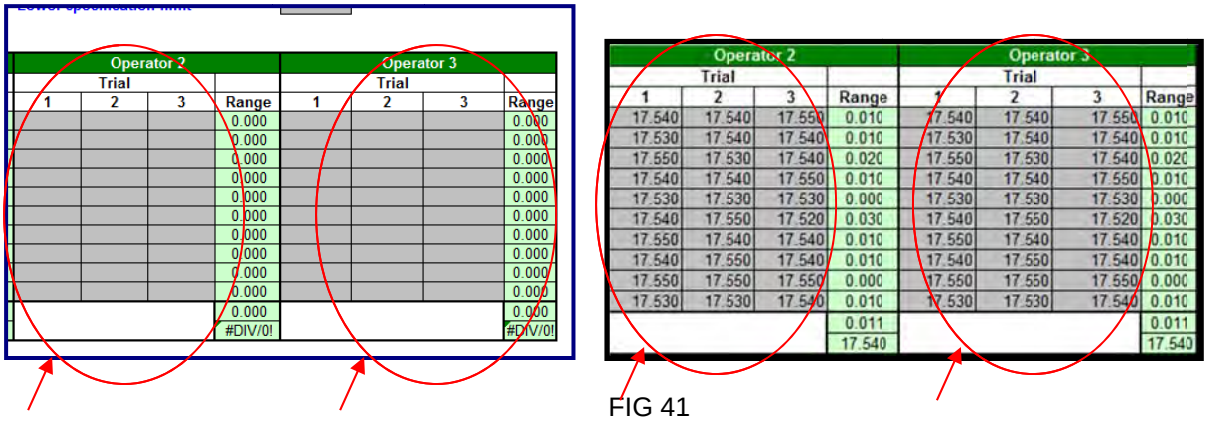
Data	Operator 1			
	Trial			
Sample #	1	2	3	Range
1				0.000
2				0.000
3				0.000
4				0.000
5				0.000
6				0.000
7				0.000
8				0.000
9				0.000
10				0.000
Range average				0.000
Sample average				#DIV/0!

Data	Operator 1			
	Trial			
Sample #	1	2	3	Range
1	17.550	17.540	17.540	0.010
2	17.540	17.520	17.530	0.020
3	17.520	17.520	17.520	0.000
4	17.550	17.540	17.540	0.010
5	17.490	17.510		0.020
6	17.550	17.540		0.010
7	17.540	17.520		0.020
8	17.520	17.520		0.000
9	17.550	17.540		0.010
10	17.550	17.540		0.010
Range average				0.011
Sample average				17.533

FIG 40

Step 6

Repeat Step 5 for Operator 2 and Operator 3 as shown in FIG 41



Operator 2				Operator 3			
Trial				Trial			
1	2	3	Range	1	2	3	Range
			0.000				0.000
			0.000				0.000
			0.000				0.000
			0.000				0.000
			0.000				0.000
			0.000				0.000
			0.000				0.000
			0.000				0.000
			0.000				0.000
			0.000				0.000
			0.000				0.000
			#DIV/0!				#DIV/0!

Operator 2				Operator 3			
Trial				Trial			
1	2	3	Range	1	2	3	Range
17.540	17.540	17.550	0.010	17.540	17.540	17.550	0.010
17.530	17.540	17.540	0.010	17.530	17.540	17.540	0.010
17.550	17.530	17.540	0.020	17.550	17.530	17.540	0.020
17.540	17.540	17.550	0.010	17.540	17.540	17.550	0.010
17.530	17.530	17.530	0.000	17.530	17.530	17.530	0.000
17.540	17.550	17.520	0.030	17.540	17.550	17.520	0.030
17.550	17.540	17.540	0.010	17.550	17.540	17.540	0.010
17.540	17.550	17.540	0.010	17.540	17.550	17.540	0.010
17.550	17.550	17.550	0.000	17.550	17.550	17.550	0.000
17.530	17.530	17.540	0.010	17.530	17.530	17.540	0.010
			0.011				0.011
			17.540				17.540

FIG 41

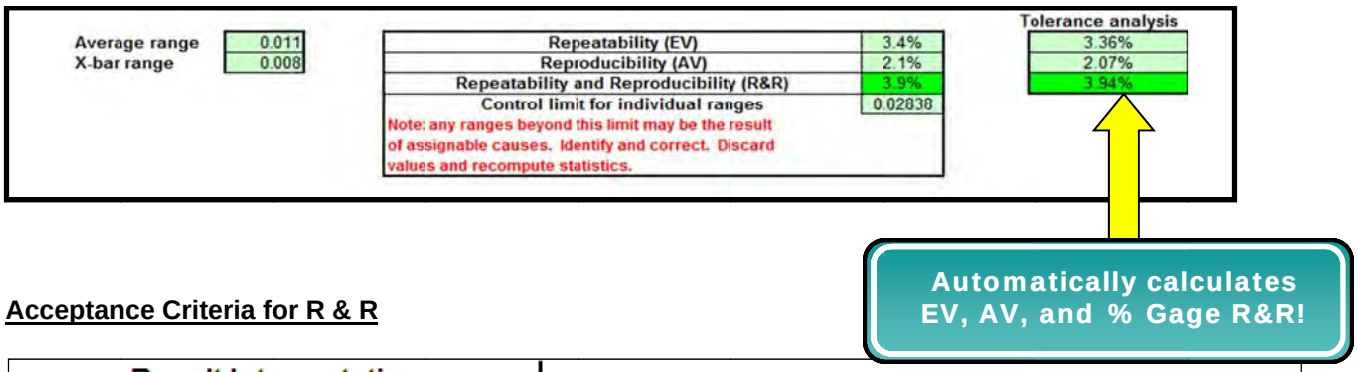
Step 7

Observe the calculated values of

% Repeatability (EV)

% Reproducibility (AV)

% Repeatability & Reproducibility (R&R)



Average range	0.011
X-bar range	0.008

Repeatability (EV)	3.4%
Reproducibility (AV)	2.1%
Repeatability and Reproducibility (R&R)	3.9%
Control limit for individual ranges	0.02830

Note: any ranges beyond this limit may be the result of assignable causes. Identify and correct. Discard values and recompute statistics.

Tolerance analysis
3.36%
2.07%
3.94%

Automatically calculates EV, AV, and % Gage R&R!

Acceptance Criteria for R & R

Result Interpretation	
Accepted (<=10%)	Instrument can be used for Capability study
Conditionally Accepted (10 to 30% Incl)	Instrument should not be used for Capability study
Rejected (Above 30%)	Instrument should not be used for any measurement

If R & R is in Yellow and Red Zone – look out for

Repeatability (EV)

&

Reproducibility (AV)

Error in Reproducibility

The inability to get the same answer from repeated measurements made under various conditions from different inspectors**.**

Possible Causes

1. Lack of Standard Operating Procedures
2. Lack of training.

Error in Repeatability

The inability to get the same answer from repeated measurements made of the same item under absolutely identical conditions.

Possible Causes

1. Lack of Standard Operating Procedures (SOP)
2. Lack of training
3. Measuring system variability

Note:

There are 6 Gage R&R Study Format provided in the "8.Gage R&R Study sheet". Supplier can enter Gage R&R Study results for maximum 6 instruments.

PPAP Playbook will not allow supplier to sign off the PW if the Gage R&R value is above 20%. Playbook will pop up error message as shown in FIG 42. You need to use the instrument which is having Acceptable range of Gage R&R Value

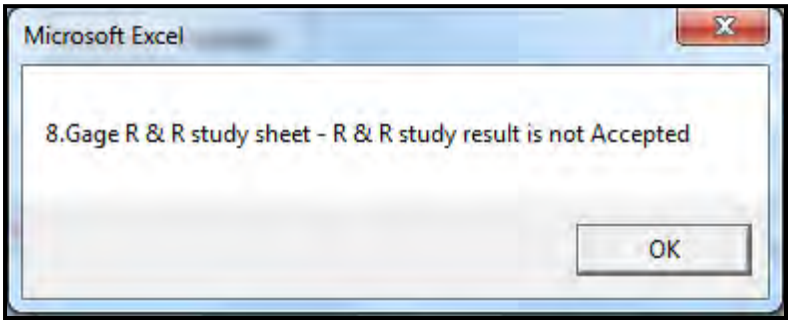


FIG 42

Section 7: How to fill out the "Dimension Report for Non Critical Dimensions sheet?"

Sheet 9a refers to "Dimensional Report for Non-critical dimension" where 5 samples are required to be measured. Measurements should be within specification – Refer FIG 43. There is no Cpk requirement defined for non-critical dimensions. The 5 samples must be taken from a production run.

9a.Dimension Report for Non-Critical Dimensions

NOTE: If you need assistance to fill the sheet, Please refer "Section 7" of PPAP USER GUIDE

Part Number	484-010020 (A)		Supplier Name	Rosti India (D)	Inspected By (G) Robert
Part Name	Pulley Roller (B)		Facility Location	India (E)	Verified By (H) Peter
Part Rev	A (C)		Supplier Code	121 (F)	Date (I) 12-Aug-12

The number of Minor characteristic data points required for part qualification is 5. 5-piece sample must be taken from a production run. Sample parts from a production run may be shipped to NCR for verification of form, fit, and function if requested by the NCR SQE

Print zone or Balloon Dwg Ref	Nominal Value	Tol +	Tol -	USL	LSL	Measuring Instrument used	Samples					Pass/Fail	NCR approval for Out of spec AND/OR Cpk Failed dimensions Provide RFC Ref no
							1	2	3	4	5		
A2	9	0.1	0.1	9.1	8.9	Vernier Caliper	9.05	9.05	9.05	9.05	9.04	Pass	NA
B4	9	0.1	0.1	9.1	8.9	Micrometer	8.8	9.09	9.07	9.07	9.07	Fail	53RFC20890
(J)	(K)	(L)	(M)	0	0	(N)	(O)					(P)	(Q)
				0	0								

FIG 43

A, B, C, D, E&F – Will get updated automatically from the PPAP submission sheet
G – Fill the Inspector Name who is carrying out the measurements
H – Fill the verifier name who is the cross verifying the measurements
I – Fill the date of measurement
J – Refers to the drawing Print Zone or Balloon drawing# from which the dimension measurement is taken
K – Refers to the Nominal value of the drawing Zone or Balloon drawing#
L&M – Refers to the tolerance applicable for the nominal value with respect to drawing
N – Mention the measuring instrument which is used to measure the particular dimension
O – Enter the measured value of the part (5 samples)
P – Sheet automatically calculates and provides the result as PASS/FAIL
Q – NCR approval is required for any Out of specification dimension. Enter the correct RFC (Request for Change) no for the failed dimension as given in the below example - Refer FIG 44

All the calculation cells in the Excel sheet are locked to avoid the manipulation of the values.
You need to enter the values in the Cell J, K, L, M N and O.

Print zone or Balloon Dwg Ref	Nominal Value	Tol +	Tol -	USL	LSL	Measuring Instrument used	Samples					Pass/Fail	NCR approval for Out of spec AND/OR Cpk Failed dimensions Provide RFC Ref no
							1	2	3	4	5		
A2	9	0.1	0.1	9.1	8.9	Vernier Caliper	9.05	9.05	9.05	9.05	9.04	Pass	NA
B4	9	0.1	0.1	9.1	8.9	Micrometer	8.8	9.09	9.07	9.07	9.07	Fail	53RFC20890

FIG 44

Note:

Supplier needs to enter only the Numerical values in the "Nominal Value" column. Symbols, Comma, Alphabets are not allowed. You can enter any specific details if required in "Print Zone" column like Radius, Chamfer, Force, Torque etc. This condition is applicable to sheet 9b also.

Child Part PPAP submission:

Supplier needs to fill separate PPAP playbook for each child parts and submit as per ETQ PPAP Request

Tolerance for Sheet Material Thickness;

For Sheet Metals, suppliers need to use the MILL tolerance from the sheet metal manufacturer not General tolerance which is specified in the drawing.

Note:

PPAP Playbook will not allow supplier to sign off the PW if any of the dimensions are out of specification OR if any of the RFCs are incorrect. Playbook will pop up error message as shown in FIG 45. You need to improve your process and bring the dimension with in specification to proceed further

OR

If supplier already has a deviation approval for any Out of specification dimension they need to enter the correct RFC number in column “T” to enable the PW sheet to sign off.
Supplier needs to contact their respective SQE for raising any RFC before PPAP submission

Error Message:

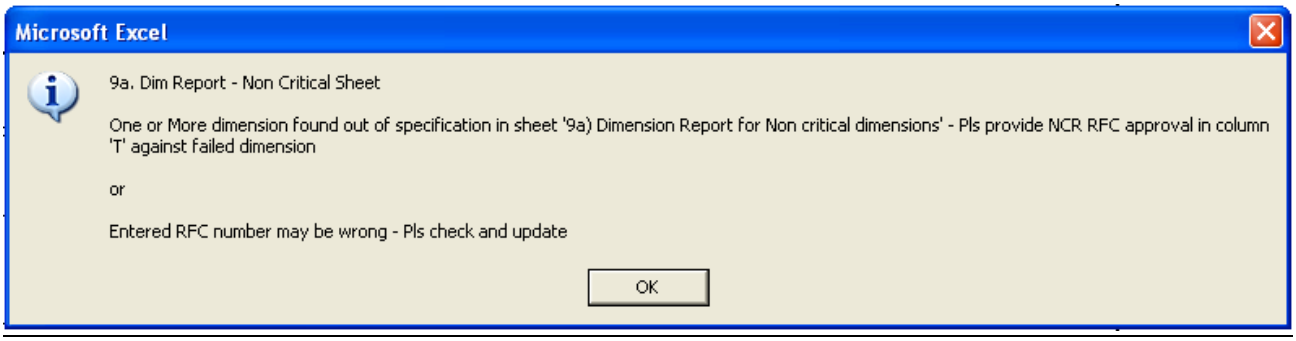
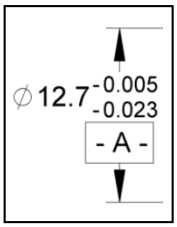


FIG 45

There may be a Scenario that the Tolerance given for a particular dimension is negative or Positive on both sides.

Example given below:



In this case you need to enter the Tolerance value in the capability sheet as below. Playbook will calculate the Cpk value automatically

Tol (+) will be - 0.005 and Tol (–) will be 0.023

Print zone or Balloon Dwg Ref	Nominal Value	Tol +	Tol -	USL	LSL	Measuring Instrument used	Samples					Average	Std Dev.	Cp	Cpk USL	Cpk LSL	Cpk	Pass/Fail	NCR approval for Out of spec AND/OR Cpk Failed dimensions Provide RFC Ref no
							1	2	3	4	5								
C2	12.70	-0.005	0.023	12.695	12.677	DRO	12.689	12.687	12.688	12.689	12.688	12.688	0.001	3.586	2.709	4.462	2.709	Pass	

Section 7.1: How to fill out the "Dimension Report for Critical Dimensions?"

Sheet 9b refers to "Dimensional Report for Critical dimension" where 30 samples are required to be measured. Measurements should possess Cpk ≥ 1.67. The 30 samples must be taken from a production run.

The critical dimension will be indicated by an Obround in the drawing released after Feb 2013.

Updating "Dimensional Report for Critical dimensions" is same as "Dimensional Report for Non critical dimension" sheet where the difference is entering the 30 sample measurement values and selection of Tolerance. This sheet is designed to enter the values of Geometric dimensions also.

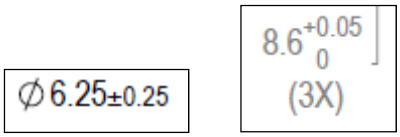
Examples of Geometric dimensions

Run out, Flatness, Parallelism, Straightness, circularity etc.

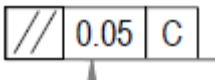
Based upon the tolerance category, the AO column is categorized into three.

1. General Tolerance
2. Geometric Tolerance
3. Others

1. General Tolerance – It is the default selection where the dimension having tolerances on both sides (A). Example as below

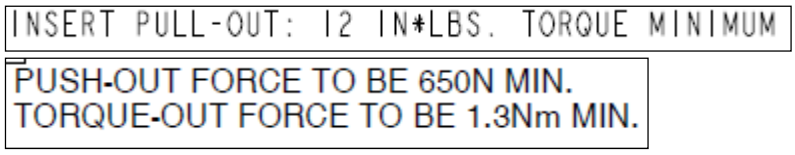


2. Geometric Tolerance – It is for Geometric feature where the tolerance applicable on Maximum side only (B). Example as below



3. Others – It is for the dimension feature where the tolerance applicable on Minimum side only (C) Example as below

Welding Strength, Pull out Force, Torque etc.



You need to select the Tolerance category by drop down menu.

Cp	Tolerance Category	Cpk	Pass/Fail	NCR approval for Out of spec AND/OR Cpk Failed dimensions Provide RFC Ref no
91.287	General Tolerance	91.226	Pass	NA
15.215	Geometric Tolerance	12.232	Pass	NA
2.086	Others	2.317	Pass	NA
0.000	General Tolerance	0.000	0	

All the calculation cells in the Excel sheet are locked to avoid the manipulation of the values. You need to enter the values in the Cell J, K, L, M, N and O. Cpk will get calculated automatically and provide the result as PASS/FAIL.

Note:

PPAP Playbook will not allow supplier to sign off the PW if any of the dimensions are out of specification/Cpk Fails OR if any of the RFCs are wrong. Playbook will pop up an error message as shown in FIG 46. You need to improve your process and bring the dimension to achieve the Cpk ≥ 1.67 to proceed further.

OR

If supplier already got deviation approval for any Out of specification/Cpk Fail dimension they need to enter the correct RFC number in column AR in order to enable the PW sheet to sign off.
Supplier needs to contact their respective SQE for raising any RFC before PPAP submission

Error message:

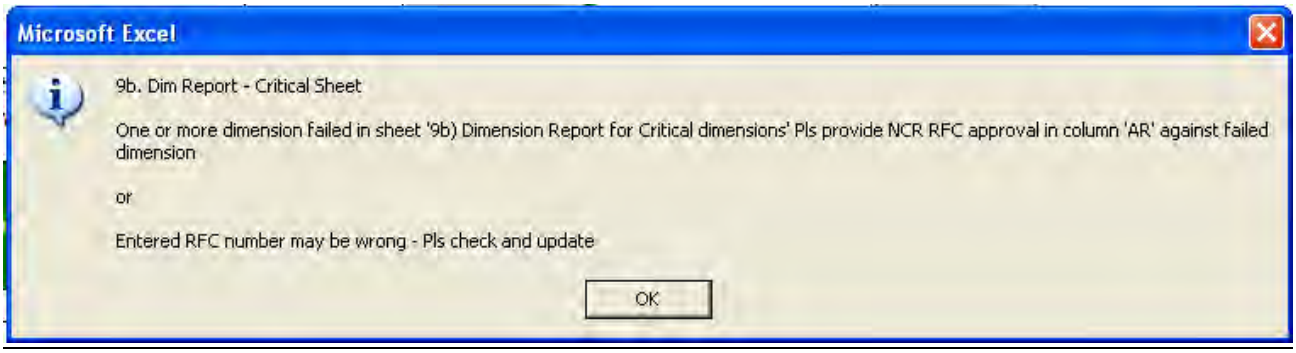


FIG 46

Gage R&R Summary

There is a tabular column below the “Dimension Report – Critical dimension” sheet where suppliers needs to provide the Gage R&R values for those instruments used for measuring critical characteristics. This is only the summary table whereas supplier needs to provide the full Gage R&R study details in sheet 8.Gage R&R Study sheet.

Gage R&R Summary			
Sl.No	Instrument ID	Instrument name	R&R Value
1	VC 001	Vernier Caliper	10%
2	MIC001	Micrometer	7%
3	MIC005	Micrometer	12%

A – Enter the serial number
B – Enter the Instrument ID
C – Enter the Instrument Name
D – Enter the Gage R&R values.

Section 8: How to fill out the "Material Test Report"?

Sheet 10a refers to Material Test Report where supplier needs to attach the evidence of using the correct Raw material/Grade as per design record – Refer FIG 47. Supplier needs to attach the Material report for all child parts in the same sheet.

10a.Material Test Report

Part Number	484-0100123
Part Name	Rulley Roller
Part Rev	A
Supplier Name	Baam Industries

Laboratory	☑ Outside laboratory
	☐ In-house laboratory
Name of Outsider laboratory (Optional)	

NOTE: If you need assistance to fill the sheet, Please refer "Section 8" of PPAP USER GUIDE

Sl.No	Part Number	Rev	Drawing specified material used?	Approved Alternate Material used as per Latest NCR document? Refer Requirement 10a in PPAP User Guide	NCR RFC approval available?	RFC Ref Number	Used Material Specification /Grade	Material Report Attached	Remarks
1	484-0100123	A	No	Yes	Yes	08RFCXXXX	Delrin 500P	No	Approved PPAP for P/N : 484-0103456

FIG 47

A, B, C&D – Will get updated automatically by entering the PPAP submission sheet
E – Please mention whether the submitted Material certificate from raw material Supplier/Outside laboratory or In house Testing (Tick the relevant Box)
F – If it is from Raw material supplier/ Outside Laboratory, please mention the name of the supplier/Lab
G – Enter the serial no
H – Enter the part no
I – Enter the REV no of the part
J – Select YES/NO from the drop down menu whether Drawing specified Material used or not
K – Select YES/NO from the drop down menu whether Approved Alternate Material used as per NCR spec 009-0028294 (Latest Version) or Not?
L – Select YES/NO from the drop down menu whether RFC approval available or not
M – Enter the RFC ref no
N – Mention the Used material Specification/Grade
O – Select YES/NO from the drop down menu whether the material report attached or not? And attach the Material Report. Format can be PDF, TIF, Xls etc.
If "No" selected – Supplier should provide information about – Approved PPAP details for the similar material. Validity of material report is 2 years from the date of report

Supplier can contact their respective SQE's to raise OR to know the status of any RFC for the alternate Material usage condition. If the RFC is not approved, the supplier cannot submit the PPAP Package.

Sl.No	Part Number	Rev	Drawing specfied material used?	Approved Alternate Material used as per NCR document 009-0028294A ?	NCR RFC approval available?	RFC Ref Number	Used Material spec / grade	Attach the material test report
1	484-0100123	A	No	Yes	Yes	53RFC20901	Delrin 500P	Material Report

Note:

If Alternate Material used for the part, Supplier needs to provide the approved correct RFC number while submitting the PPAP as given above. Playbook will not allow supplier to sign off the PW without entering the RFC number when alternate material is used. An Error message as shown in FIG 48 will appear if the RFC number is missing.

Error message:

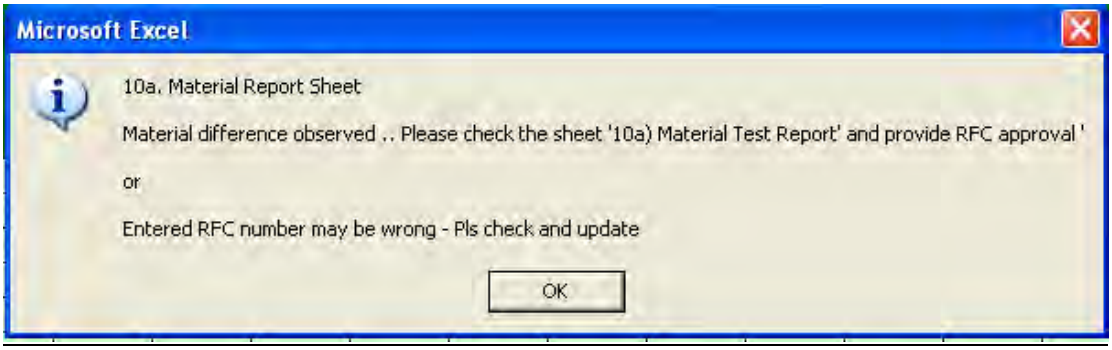


FIG 48

If supplier selects “No” in Material report attachment column “I”, a Pop-Up message as shown in Fig 48A will appear. Click “OK” and perform following action

- Supplier should provide similar Material accepted PPAP reference Part # in Column “Remarks”
- Validity of Material Test report – 2 Years

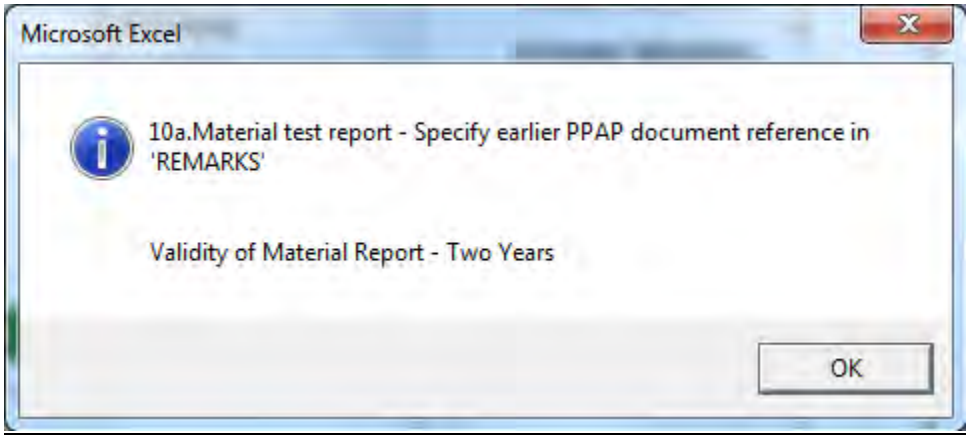


FIG 48A

UL Certification

Supplier needs to provide the UL report (UL Yellow card) for plastic parts, Adhesives, Gaskets, labels etc. wherever applicable. There is a separate column in Appearance Report to attach the UL certification – Refer Section 11

Section 9: How to fill out the "Performance Test Results sheet"?

Where supplier needs to attach the performance test results as per drawing specification – Refer FIG 49

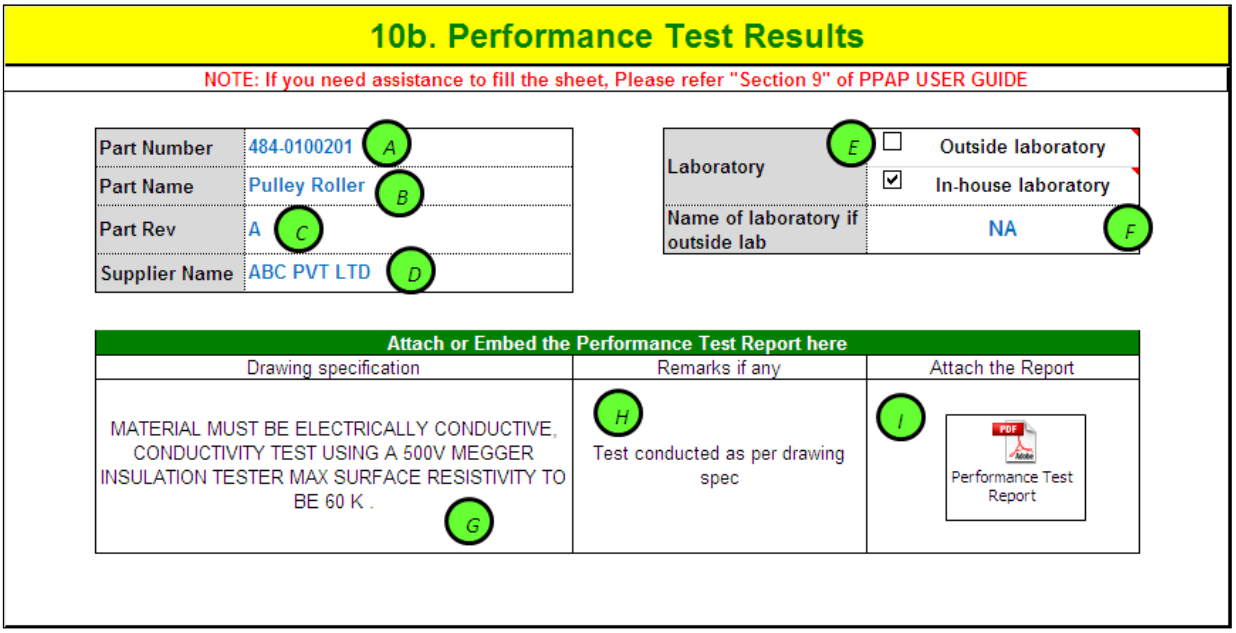


FIG 49

A, B, C&D – Will get automatically updated
E – Please mention whether the submitted Performance Test was carried out by an Outside laboratory or In house Testing (Tick the relevant Box)
F – If it is from Outside Laboratory, please mention the name of the Lab
G – Enter the drawing specification
H – Enter Remarks if any
G – Attach the Performance Test Results in any supplier format (Format can be PDF, TIF, Xls etc.)

Section 10: How to fill out the "RoHS Compliance report"?

Sheet 10c refers to the RoHS Compliance Report where supplier needs to attach the evidence of the RoHS certification/Declaration for their products.
Irrespective of the RoHS Standards called in drawing, supplier needs to provide the RoHS certification as per latest European Union Directive (2011/65/EU).Refer FIG 50.

RoHS certification required for both Material and Coating.

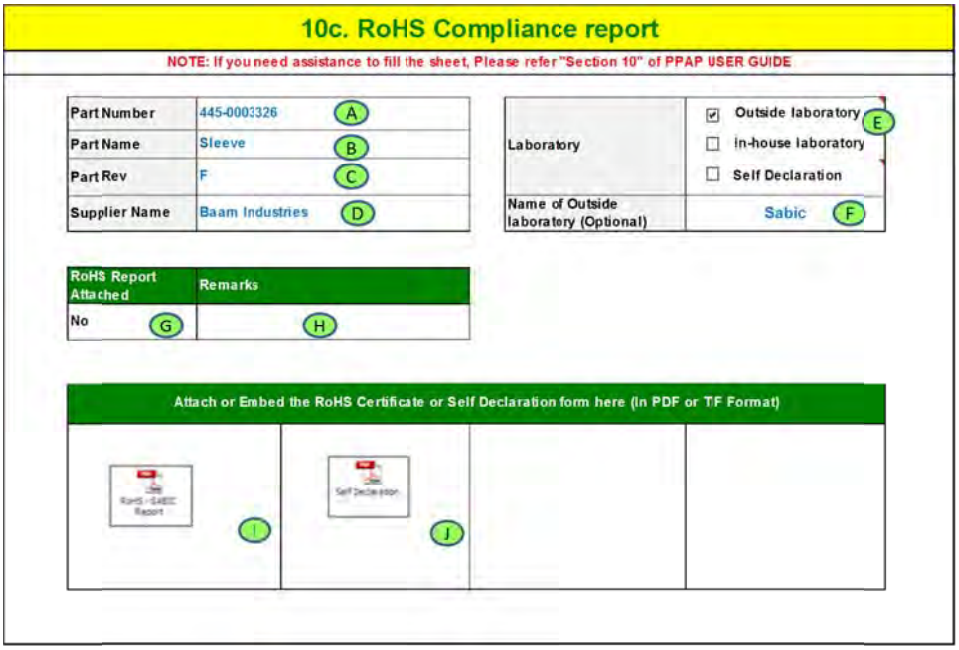


FIG 50

A, B, C&D – Will get automatically updated
E – Please mention whether the submitted RoHS certificate is from raw material Supplier/Outside laboratory or In house Testing (Tick the relevant Box)
F – If it is from Raw material supplier/ Outside Laboratory, please mention the name of the supplier/Lab
G – Select from drop down menu "YES/NO" for RoHS report attachment
H – If "No" selected – Supplier should provide information about – Approved PPAP details for the RoHS compliance report .Validity of RoHS compliance report is 2 years from the date of report
I – Attach the RoHS certificate from Supplier/Outside laboratory OR
J – Attach the self-declaration RoHS report in supplier's letter head with authorized signature (Format can be PDF, TIF, Xls etc.)

If supplier select "No" in RoHS report attachment (Column "B"), a Pop – Up message as shown in FIG 50A will appear. Click "OK" and perform following action

- Supplier should provide similar RoHS Material accepted PPAP reference part# in Column "Remarks"
- Validity of RoHS Compliance report – 2 Years

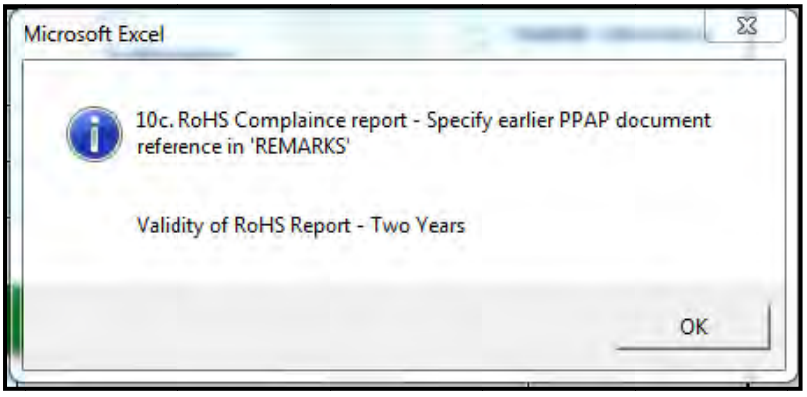
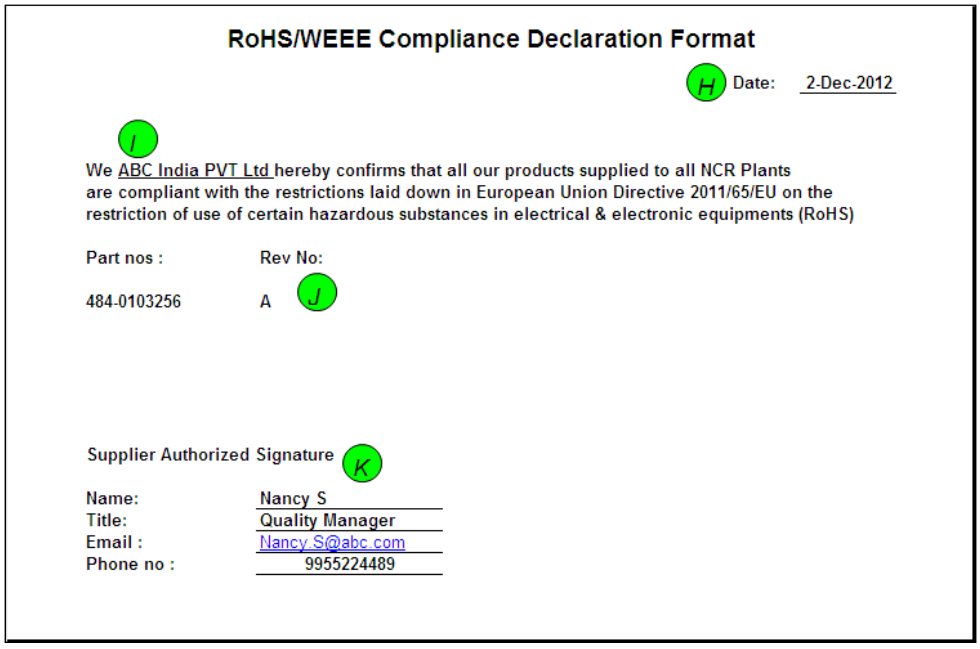


FIG 50A

Sample format for RoHS Self declaration is given below – Refer 51



RoHS/WEEE Compliance Declaration Format

H Date: 2-Dec-2012

I

We ABC India PVT Ltd hereby confirms that all our products supplied to all NCR Plants are compliant with the restrictions laid down in European Union Directive 2011/65/EU on the restriction of use of certain hazardous substances in electrical & electronic equipments (RoHS)

Part nos :	Rev No:
484-0103256	A J

Supplier Authorized Signature K

Name:	Nancy S
Title:	Quality Manager
Email :	Nancy.S@abc.com
Phone no :	9955224489

FIG 51

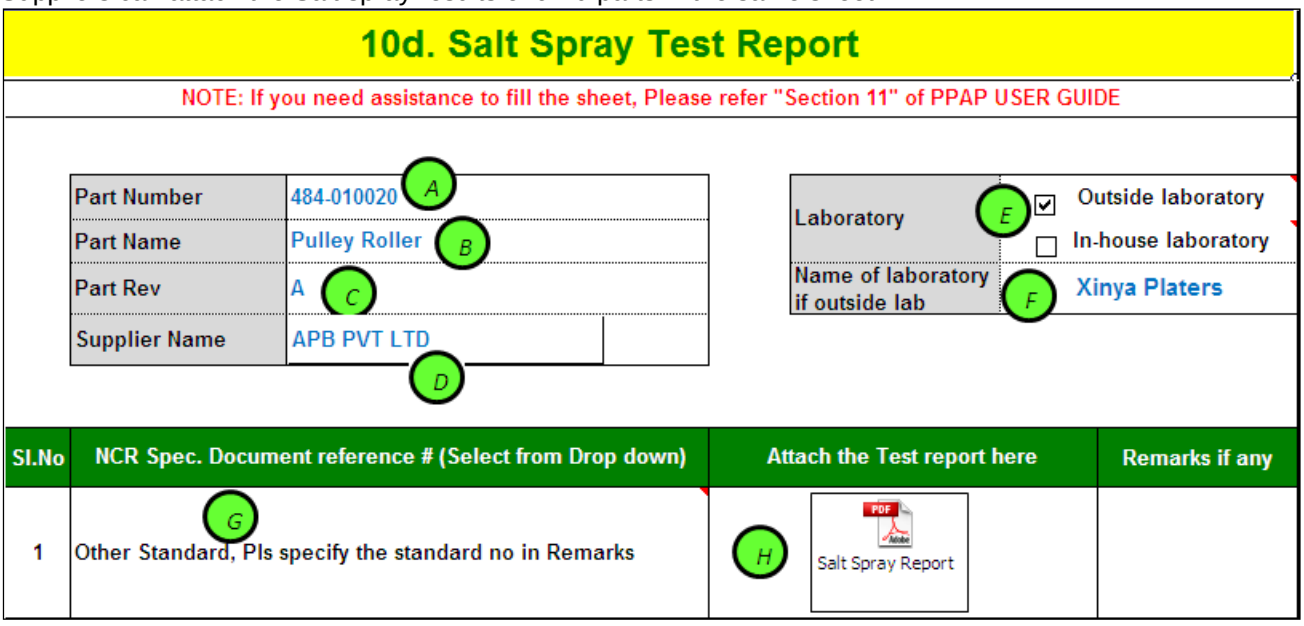
H – Fill the Date
I – Fill the Supplier name
J – Fill the part# along with REV level
K – Fill the supplier Authorized signatory name and designation along with contact no

The Self Declaration to be provided in Supplier Letter head with authorized signature.

Section 11: How to fill out the "Salt Spray Test Report"?

Sheet 10d refers to Salt Spray Certification requirements for plating parts where supplier needs to provide the evidence of the Salt Spray test results as per NCR Plating Specification – Refer FIG 52

Suppliers can attach the Salt spray results of child parts in the same sheet.



10d. Salt Spray Test Report

NOTE: If you need assistance to fill the sheet, Please refer "Section 11" of PPAP USER GUIDE

Part Number	484-010020 A
Part Name	Pulley Roller B
Part Rev	A C
Supplier Name	APB PVT LTD D

Laboratory E	☑ Outside laboratory ☐ In-house laboratory
Name of laboratory if outside lab F	Xinya Platers

Sl.No	NCR Spec. Document reference # (Select from Drop down)	Attach the Test report here	Remarks if any
1	G Other Standard, Pls specify the standard no in Remarks	H Salt Spray Report	

FIG 52

A, B, C&D – Will get automatically updated
E – Indicate who conducted the Salt Spray test: Outside laboratory or in house
F – If it is from Raw material supplier or Outside Laboratory, provided the name of the supplier/Lab
G – Select the Specification from Drop down menu
H – Attach the Salt Spray Test Report (Format can be PDF, TIF, Xls etc.)

Note:

Material Lot based Salt Spray test report is acceptable
Note: Refer Material Lot number in Material Test report and Salt Spray report
Validity of the Report is 1 year

Section 12: How to fill out the "Appearance Report"?

Sheet 13 refers to "Appearance Report" where supplier needs to attach the part image and marking details which are related to appearance of the part.

Part Image and Part marking details: Refer FIG 53

Supplier needs to attach one or more images of the part in order to visualize the physical part clearly

Also attach part marking images which is specified in drawing notes

Example: Recycle symbol, Part no, UL no, Molders name, Ejection Location etc.

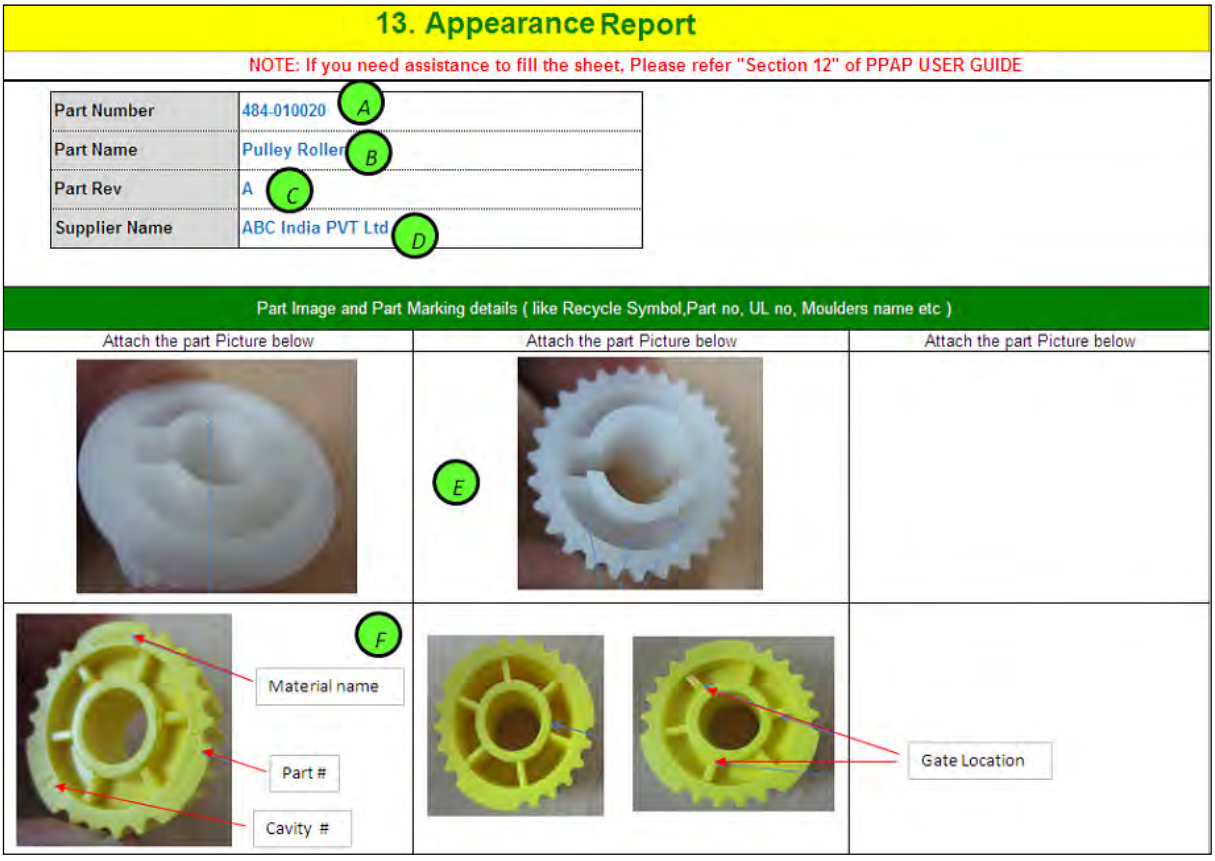


FIG 53

A, B, C, D – Will get updated automatically from PPAP submission sheet
E – Attach the Multiple images for the part (Examples attached)
F – Attach the Part marking images

Adhesion Test Results for Painted Parts: Refer FIG 54

Supplier needs to attach the Adhesion Test results for the Painted parts as per below ASTM Standard

Adhesion by Tape Test

Test in accordance with ASTM D-3359. A rating of 5* using method B is (cross-cut tap test) is required.
*The edges of the cuts are completely smooth; none of the squares of the lattice are detached.

Adhesion Test Results for Painted Parts		
Testing Standard	Attach the Test results/Picture	Remarks
A ADHESION CONFIRM TO ASTM D-3359. RATING 5	B  	Classification chart 5B test Pass

FIG 54

A – Mention the Testing Standard details
B – Attach the Test result image (Example Attached)

RAL SHADE CARD DETAILS for Painted Parts: - Refer FIG 55

Supplier needs to attach the RAL Shade card details as per drawing.
Shade Card – It is a Sample Color chip given by the Paint Manufacturer as per the RAL code of the drawing which is used as a reference to cross verify the painted parts

RAL Shade Card details for Painted Parts		
Attach the Shade card Picture below	Attach the Physical part Picture below	Remarks
 A	B 	COATING: SELF TEXTURING POLYESTER POWDER PAINT, LEATHERETTE SEMI-GLOSS FINISH, RAL 260 40 05

FIG 55

A – Attach the RAL Shade card image (Example: Trimite shade card picture for the RAL code mentioned in the drawing)
B – Attach the Physical part image to match the RAL shade card (Example attached)

UL Certification:

Where supplier needs to attach the UL Report (Yellow card) for the used material – Refer FIG 56

UL Certification (Attach the Report below)		
Drawing specified UL no	Supplier Used UL no	Attach the UL Report
A V2 or Better	B V2 Rating	C UL Certificate

FIG 56

A – Specify the drawing called UL rating
B – Enter the supplier used UL raring
C – Attach the UL Report

Drawing Notes confirmation:

This section is where the supplier needs to measure/Confirm the possible drawing notes as shown in FIG 57

Drawing notes confirmation			
Sl.No	Drawing Notes	Measurement value/Confirmation	Remarks if any
1	Flash Permitted upto 0.1mm (F)	0.05mm	OK
2	Ejector Pin Marks 0.1 Depressed	0.1mm (G)	OK
3	Draft for Other surfaces 1deg Max	1 Deg max	OK
4	General Surface as produced by SPI/SPE Mould Finish	Confirmed	OK
(E)			

FIG 57

E – Enter the serial no
F – Enter the drawing notes
G – Measure/Confirm as per drawing notes

Section 13: How to fill out the "List of Checking Aids sheet"?

Sheet 16 refers to List of Checking Aids where supplier needs to provide the Instrument name and its calibration details along with Gage R&R value – Refer FIG 58

Supplier can also attach full list of checking aids with the following details in his own format

16.List of checking Aids

Part Number	Pulley Roller (A)	Part Rev	A (C)
Part Name	484-0100201 (B)	Supplier Name	ABC PVT LTD (D)

NOTE: If you need assistance to fill the sheet, Please refer "Section 13" of PPAP USER GUIDE

Sl. No	Gauge / Instrument Name	ID of Gauge / Instrument	Calibrated On (Date)	Next Calibration Due Date	Remarks if any
1 (E)	Vernier Caliper (F)	VC 001/QC (G)	1-Jan-13 (H)	31-Dec-13 (I)	(J)

FIG 58

A, B, C and D – Will get automatically updated from PPAP submission sheet
E – Enter the serial#
F – Fill the measuring instrument name
G – Fill the measuring instrument ID
H – Fill the last calibrated date
I – Fill the Next calibration due date
J – Remarks if any

Section 14: How to attach the “Engineering Approval Form”?

Engineering approval refers to formal approval given by NCR Engineering team for the parts involved in the PPAP.
The following type of parts will fall under this category but not limited to - Electronic parts like PCBs, Cables, harnesses, sensors, solenoids, Motors, Locks, catalogue parts like bearings, springs, grease, Screws, Washers

FIG 59 shows an example of an Engineering Approval Form for a Touch screen. Suppliers are requested to attach the Engineering Approval form while PPAP submission

Note: Supplier can attach or embed the Engg approval Form which has been received from the NCR engineering team in the sheet 17.a as shown in FIG 59

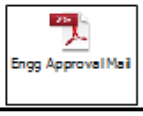
17a.Engineering Approval Form			
NOTE: If you need assistance to fill the sheet, Please refer "Section 14" of PPAP USER GUIDE			
NCR Engineer:	Bruce Mcbain		
Part Number:	009-0027702	Part Revision	A
Part Name:	Touch Screen 10.4 inch		
Supplier Name:	Touch International	Supplier P/N:	NA
APPROVALS	Approver signature		Date:
Supplier can attach Engg approval copy if available			

FIG 59

Section 15: How to fill out the “Sub Supplier Source details as per BOM”?

Sheet 17.b refers to the Sub supplier source details where the supplier needs to provide their sub supplier’s details for each part as applicable – Refer FIG 60

17b.Sub Supplier Source details as per BOM

Part Number		484-0100201 (A)		Part Revision	A (C)
Part Name		Pulley Roller (B)		Supplier Name	ABC PVT Ltd (D)

NOTE: If you need assistance to fill the sheet, Please refer "Section 15" of PPAP USER GUIDE

Sl. No	Part no	Rev	Description	Process/Operation Name	Sub Supplier Name	Supplier Part Number (If any)	Rev	Sub Supplier Location	Remarks
(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)

FIG 60

A, B, C & D – Will get automatically get updated from PPAP submission sheet
E – Enter the serial #
F – Enter the Part #
G – Fill the Revision
H – Fill the Part Name
I – Fill the Process/Operation Name (If one part has more than 1 supplier for different Operations/Processes)
J – Fill the Sub supplier name
K – Fill the Sub Supplier Part Number
L – Fill the Sub Supplier Part Number Revision
M – Fill the Sub supplier location
N – Fill the Remarks like Plating supplier, Raw Material supplier etc.

Note: For catalogue parts (Starts with 009,006 etc.), Supplier needs to confirm the supplier source as per NCR AVL (Approved Vendor List) list

If required, supplier needs to provide dimension results, Material Test report and RoHS reports for the catalogue parts where supplier is not procuring from NCR AVL List (Buyers Option).Usage of Non AVL listed parts will requires Engineering approval.

Section 16: How to fill out the “Packaging Test Report”?

Sheet 17.c refers to the Packaging Test report, where the supplier needs to provide packaging test report as per ISTA procedure

FIG 60 shows an example of “Packaging Test Report”. Suppliers are requested to fill the test report or attach the outside laboratory test report

17c.Packaging Test Report

Part Number	484-0103270 (A)	Revision	A (C)
Part Name	Bracket (B)	Supplier Name	Alex Works (D)

NOTE: If you need assistance to fill the sheet, Please refer "Section 16" of PPAP USER GUIDE

Net Weight	(E)			
Package Size	Length: (F)	Width: (G)	Height: (H)	
Palletized ☐	(I)	Non Palletized ☐		
Package Material	(J)			
Package Test Category (K)	I ☐	II ☐	III ☐	IV ☐ V ☐

Test Results

1	Vibration Test	Passed ☐	Failed ☐	Remarks (L)
2	Shock Drop Height	Passed ☐	Failed ☐	Remarks (M)
3	Impact Test	Passed ☐	Failed ☐	Remarks (N)
4	Compression (Stackability)	Passed ☐	Failed ☐	Remarks (O)
5	Fork lift Handling	Passed ☐	Failed ☐	Remarks (P)
6	International Conditioning (Temp/RH)			
Attach the Test Report		(Q)		

A, B, C & D – Will get updated automatically from PPAP submission sheet
E – Enter the Net weight of the Package
F, G, H – Enter the Length, Width, Height of the Package
I – Select Palletized or Non – Palletized as applicable
J – Declare the material of carton box
K – Select the category based on ISTA guidelines
L, M.N, O, P – Provide Test result as applicable to category
Q – Attach outside Laboratory test report

Section 17: How to fill out the "NCR Production Warrant (PW)"?

1. PART INFORMATION:
   Supplier enters the information about the part and submission level

NCR

18.NCR Production Warrant

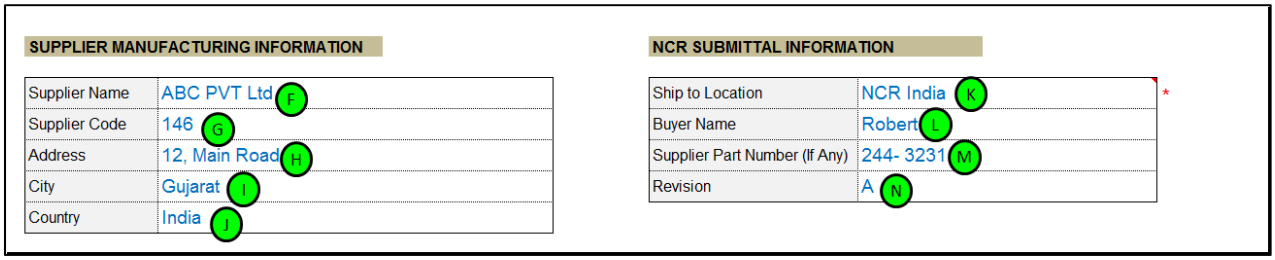
PART INFORMATION

NCR Part Number	Pulley Roller (A)	Part Revision	A (B)
Part Name	484-0100201 (C)	Part Revision Date	29-Jun-12 (E)
PPAP Submission Level	Level 1 (D)		

A, B, C, D & E – Will get automatically filled once you update PPAP Submission sheet

2. SUPPLIER MANUFACTURING INFORMATION:

Supplier enters the complete address of their Manufacturing plant

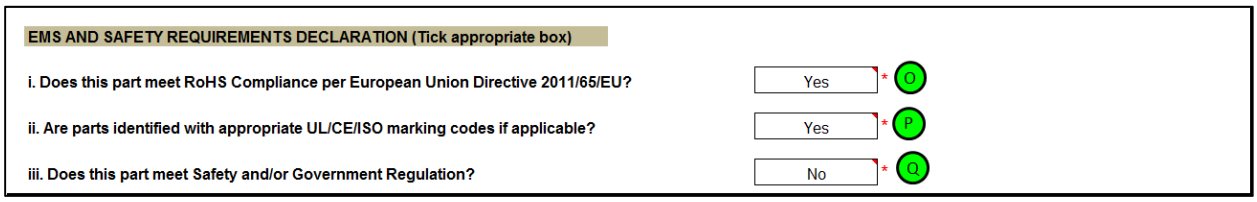


F, G, H, I & J – Will get automatically filled once you update the PPAP Submission sheet
K – Fill the NCR location where supplier going to supply the part. (If supplier supplying to Multi NCR location means, it is advised to enter any one NCR location) - This information is required to conduct "Line Try Out" – Mandatory field, need to be filled
L – Fill the Buyer name (Buyer is the person who is sending Purchase Order to you) - **Not Mandatory**
M – Enter the Supplier Part number if any
N – Enter the Rev of Supplier Part Number

Note: Playbook will not allow the supplier to sign off the "SUBMISSION RESULTS" if "K" field is Blank.

3. EMS AND SAFETY REGULATION REQUIREMENTS:

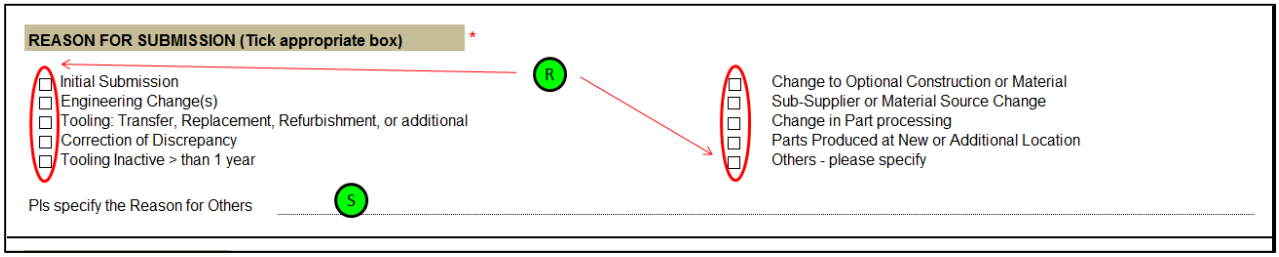
Where supplier needs to declare about Safety and RoHS requirements



O - Declaration about RoHS requirements (Select from Drop down menu)
P - Declaration about UL/CE/ISO marking codes (Select from Drop down menu)
Q - Declaration about Safety and Government Regulation (Select from Drop down menu)

Note: Playbook will not allow the supplier to sign off the "SUBMISSION RESULTS" if any of the above Boxes are blank

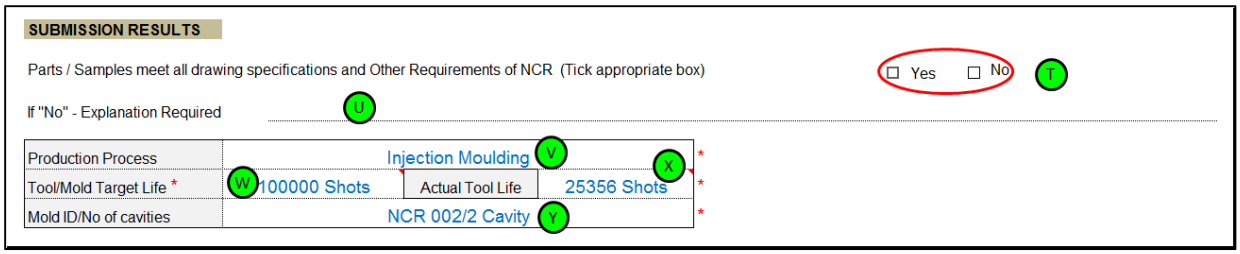
4. REASON FOR SUBMISSION:
Supplier provides the reason for submitting the PPAP Package



R – Provide the correct reason for submitting the PPAP package to NCR by clicking the relevant Box.
Q – Provide any specific reason if the check Box is "Others – please specify"
Note: Pls use this "Others" column to specify PQV E Audit

5. SUBMISSION RESULTS :

Supplier confirm that they have met the Drawing specifications along with Production process and Tool/Mold details

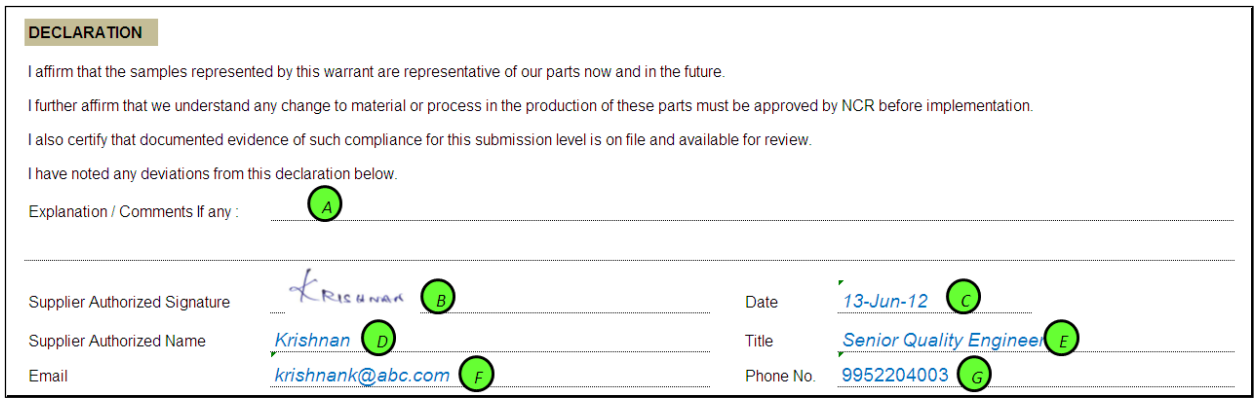


T – Click the Relevant Box.
U – If "No" means, Explanation required for the deviating condition if any.
V – Provide the Production process for manufacturing the part. Example: Injection Molding, Stamping, CNC Turning etc.
W – Provide the Tool/Mold Target life detail which is used to manufacture the part. Enter N/A if not applicable. (Ex: 100000 Shots)
X – Provide the Actual Tool/Mold life details for the same part. Enter N/A if not applicable. (Ex: 25000 Shots)
Y – Provide the Tool/Mold Identification number and No of cavities. Enter N/A if not applicable

Note: Playbook will not allow the supplier to sign off the "SUBMISSION RESULTS" if V, W, X & Y fields are Blank.

6. DECLARATION:

Supplier declares that the Completed PPAP Package which conforms to NCR Specification.

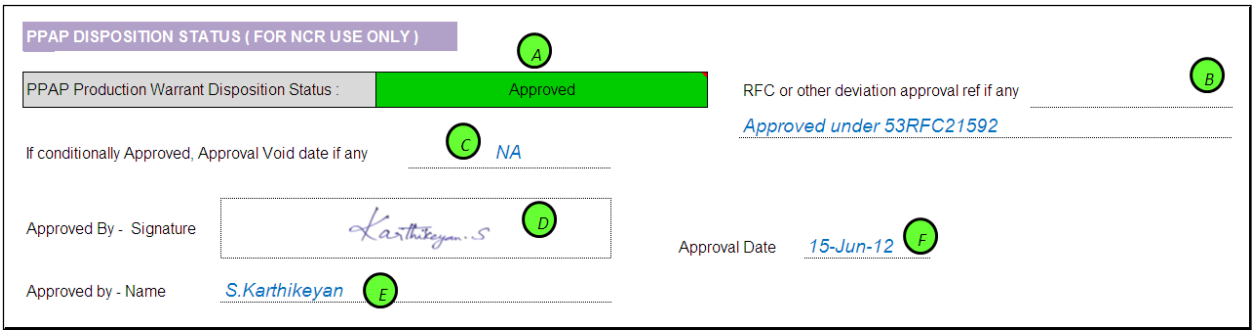


A – Needs to provide the explanation for the deviating condition if any.
B&C – Provide supplier authorized representative Name and e-signature along with date
D&E – Provide the Supplier Representative name along with Title
F&G – Provide Supplier Mail id and Phone no.

Note: Playbook will not allow the supplier to sign off the "SUBMISSION RESULTS" if C, D and E fields are Blank.

7. FOR NCR USE ONLY:

This column is used by NCR to provide the PPAP Package results.



A – PPAP result status Approved/Rejected/Conditionally Approved based on the review results of the submitted PPAP.
B – Any related RFC# will be updated here
C – Void date of PPAP if it is conditionally approved
D&F – NCR Review person authorized e-signature along with date
E – NCR Review person name

Note: NCR has the rights to withdraw the PPAP approval if they have found any Manufacturing or Field failure issues in the PPAP approved part.

A – NCR Review person authorized e-signature
B&C – NCR Review person name along with the date of Withdrawal
D – Reason for withdrawal

Error message:

Note: Supplier needs to fill all the Mandatory fields mentioned in (*) in PW. Playbook will not allow supplier to signoff the PW and Pop up an error message if any of the field is blank as shown in FIG 61

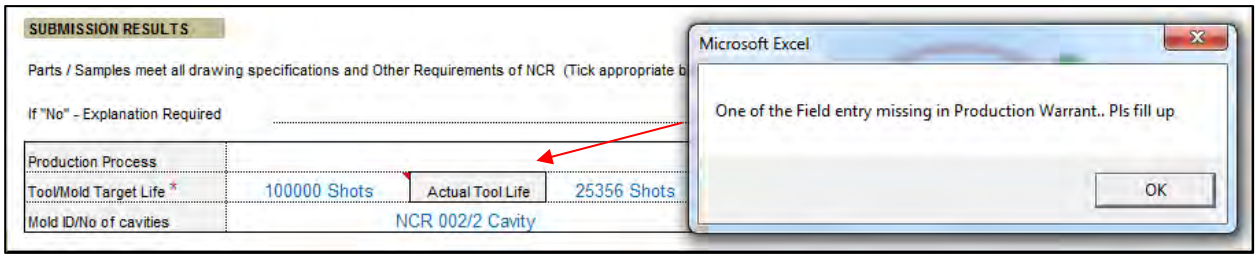


FIG 61

After approval, signed off Production Warrant will be sent to supplier through ETQ.