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

1 Purpose 4
2 When is a PPAP submission required? 4
3 Scope 4
4 Definitions & Terminologies 5
   4.1 NCR PPAP 5
   4.2 Other terms & Definitions 5
   4.3 NCR PPAP Submission Levels 5
   4.4 Disposition Status 5
       4.4.1 Approval 5
       4.4.2 Rejected 6
       4.4.3 Interim Approval 6
5 Documents 6
   5.1 PPAP Playbook 6
6 Process Requirements 6
   6.1 General Guidelines 6
   6.2 Submission Levels 7
7 PPAP request to supplier 8
   7.1 How will you receive PPAP Request from NCR? 8
       7.1.1 What to do if PPAP request not received from PPAP team? 12
       7.1.2 Whom to contact regarding part issues prior to PPAP submission? 12
   7.2 How the supplier should submit PPAP? 12
   7.3 What is Required Closure Date? 12
   7.4 NCR PPAP Process 13
8 Explanation on PPAP requirements 13
   8.1 Requirement 1: Design Records 13
   8.2 Requirement 1a: Balloon drawing 13
   8.3 Requirement 2: Approved Engineering change document 14
   8.4 Requirement 3: Customer Engineering Approval 14
   8.5 Requirement 4: Design FMEA 14
   8.6 Requirement 5: Process Flow Diagram 14
   8.7 Requirement 6: Process Failure Mode and Effects Analysis (PFMEA) 14
   8.8 Requirement 7: Control Plan 14
   8.9 Requirement 8: Measurement System Analysis Studies (MSA) 15
   9.0 Requirement 9: Dimensional Results 15
   9.1 Requirement 10a: Material Test Report 15
   9.2 Requirement 10b: Performance Test Results 16
   9.3 Requirement 10c: RoHS Compliance Report 16
   9.4 Requirement 10d: Salt Spray Test report 16
   9.5 Requirement 11: Initial Process Studies 17
   9.6 Requirement 12: Qualified Laboratory Documentation 17
   9.7 Requirement 13: Appearance Report 17
   9.8 Requirement 14: Sample product 18
   9.9 Requirement 15: Master Sample 18
   10 Requirement 16 Checking Aids 18
HOW TO COMPLETE PPAP PLAYBOOK?

Section 1: How to fill out the “PPAP Submission Details”? 21
Section 2: How to attach “Balloon Drawing”? 23
Section 3: How to fill out the “Process Flow Diagram”? 27
Section 4: How to fill out the “Process Failure Modes and Effects Analysis (PFMEA)”? 29
Section 5: How to fill out the “Control Plan” sheet? 38
Section 6: How to fill out the “Gage R&R Study”? 41
Section 7: How to fill out the 9a.”Dimension report for Non Critical dimensions” sheet? 46
Section 7.1: How to fill out the 9b.”Dimension Report for Critical dimensions” sheet? 48
Section 8: How to fill out the “Material Test Report”? 50
Section 9: How to fill out the “Performance Test Results”? 52
Section 10: How to fill out the “RoHS Compliance Report”? 52
Section 11: How to fill out the “Salt Spray Test Report”? 54
Section 12: How to fill out the “Appearance Report”? 55
Section 13: How to fill out the “List of Checking Aids”? 57
Section 14: How to attach the “Engineering Approval Form”? 58
Section 15: How to fill out the “Sub Supplier Source details as per BOM”? 59
Section 16: How to fill out the “Packaging test report”? 59
Section 17: How to fill out the “NCR Production Warrant (PW)”? 60
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

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIAG</td>
<td>Automotive Industry Action Group</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society for Testing and Materials</td>
</tr>
<tr>
<td>AT</td>
<td>Acceptance Test</td>
</tr>
<tr>
<td>AVL</td>
<td>Approved Vendor List</td>
</tr>
<tr>
<td>AR</td>
<td>Appearance Report</td>
</tr>
<tr>
<td>DFMEA</td>
<td>Design Failure Mode Effects Analysis</td>
</tr>
<tr>
<td>ETQ</td>
<td>Excellence thro Quality</td>
</tr>
<tr>
<td>FAI</td>
<td>First Article Inspection</td>
</tr>
<tr>
<td>GRR</td>
<td>Gauge Repeatability &amp; Reproducibility</td>
</tr>
<tr>
<td>MSA</td>
<td>Measurement System Analysis</td>
</tr>
<tr>
<td>MIP</td>
<td>Manufacturing Incorporation Point</td>
</tr>
<tr>
<td>NPI</td>
<td>New Product Introduction</td>
</tr>
<tr>
<td>PFD</td>
<td>Process Flow Diagram</td>
</tr>
<tr>
<td>PFMEA</td>
<td>Process Failure Mode Effects Analysis</td>
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<tr>
<td>PW</td>
<td>Production Warrant</td>
</tr>
<tr>
<td>RPN</td>
<td>Risk Priority Number</td>
</tr>
<tr>
<td>RoHS</td>
<td>Restriction of Hazardous Substances</td>
</tr>
<tr>
<td>RFQ</td>
<td>Request for Quote</td>
</tr>
<tr>
<td>RCD</td>
<td>Required Closure Date</td>
</tr>
<tr>
<td>RFC</td>
<td>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.,</td>
</tr>
<tr>
<td>SDE</td>
<td>Supplier Development Engineer</td>
</tr>
<tr>
<td>SQE</td>
<td>Supplier Quality Engineer</td>
</tr>
<tr>
<td>SCAR</td>
<td>Supplier Corrective Action Report</td>
</tr>
<tr>
<td>CAPA</td>
<td>Corrective Action Preventive Action</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
</tbody>
</table>

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.

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

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

---

**To View PPAP Request**

- 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

---
To View the details of PPAP Request

- Click on the PPAP Part number
- Separate window open as shown in Fig 1C
Click Tab “PPAP Level Requirement” as per 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
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

![PPAP High Level Process Map](image)

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 Requirement 1a: 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 failure 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:

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.

9.1 Requirement 10a: 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 be 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 Requirement 10b: 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.

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

<table>
<thead>
<tr>
<th>PPAP Submission Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTE:</strong> If you need assistance to fill the sheet, please refer “Section 1” of PPAP USER GUIDE</td>
</tr>
<tr>
<td>Submission Date: 13-Jun-2012</td>
</tr>
<tr>
<td>Part Number: 484.0100201</td>
</tr>
<tr>
<td>Part Name: Pulley Roller</td>
</tr>
<tr>
<td>Part Revision: A</td>
</tr>
<tr>
<td>Part Revision Date: 29-Jun-12</td>
</tr>
<tr>
<td>PPAP Submission Level: Level 1</td>
</tr>
<tr>
<td>Supplier representative for PPAP: Robert</td>
</tr>
<tr>
<td>Supplier Name: ABC PVI LTD</td>
</tr>
<tr>
<td>Supplier Code: 146</td>
</tr>
<tr>
<td>Street Address: 12, main road</td>
</tr>
<tr>
<td>City: Gujarat</td>
</tr>
<tr>
<td>Country: India</td>
</tr>
<tr>
<td>Zip: 358383</td>
</tr>
<tr>
<td>Phone/Mobile # with country code: +91.9052904115</td>
</tr>
<tr>
<td>Supplier email ID: <a href="mailto:Robert@abc.com">Robert@abc.com</a></td>
</tr>
</tbody>
</table>

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.
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.
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:

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

Dimensions marked as ‘(REF)’ are reference dimension. These dimensions need not be called in the dimension report.

Dimensions marked inside an Obround are Critical dimensions. These dimensions are to be measured for 30 samples and to achieve the process capability of >= 1.67 Cpk.
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.

- Drawing notes and specific tabulated details. FIG 9

<table>
<thead>
<tr>
<th>GEAR DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEAR TYPE</td>
</tr>
<tr>
<td>BASIC RACK TOOTH FORM</td>
</tr>
<tr>
<td>NUMBER OF TEETH</td>
</tr>
<tr>
<td>DIAMETRAL PITCH</td>
</tr>
<tr>
<td>NORMAL PRESSURE ANGLE</td>
</tr>
<tr>
<td>PITCH DIAMETER</td>
</tr>
<tr>
<td>OUTSIDE DIAMETER</td>
</tr>
<tr>
<td>WHOLE TOOTH DEPTH</td>
</tr>
<tr>
<td>MEASUREMENT OVER WIRES</td>
</tr>
<tr>
<td>WIRE DIAMETER</td>
</tr>
<tr>
<td>TTCE</td>
</tr>
<tr>
<td>TCE</td>
</tr>
<tr>
<td>MAX. INDICATOR READING</td>
</tr>
<tr>
<td>MIN. INDICATOR READING</td>
</tr>
<tr>
<td>TOOTH THICKNESS</td>
</tr>
<tr>
<td>CHECKING PRESSURE</td>
</tr>
</tbody>
</table>

Gear details in the data table to be verified in the Dimension report.
All measurable data needs to be measured and filled in the Dimension report.
E.g.: Outside Diameter, Measurement over Wires, Wire Diameter, TCE, No of Teeth, Tooth Thickness

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 9

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.

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

![Process Flow Diagram](image)

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.

![Process Flow Diagram](image)

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

![FIG 13](image)

Step 3

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

![FIG 14](image)

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.
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

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, Xls, and TIF etc.
STEP 1
Write down the Process step Description as per Process Flow diagram in Column A – Refer FIG 16

Fig 16

STEP 2
Write down the requirement for the Process Step / Function in Column B – Refer FIG 17

Fig 17
STEP 3
Write down the Potential failure mode for the process in Column C – Refer FIG 18

STEP 4
Write down the Potential effect of Failure for the Failure Mode in Column D – Refer 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

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

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)
STEP 8

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

RPN = Severity X Occurrence X Detection

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>
<thead>
<tr>
<th>Effect</th>
<th>Criteria: Severity of effect on product (customer effect)</th>
<th>Rank</th>
<th>Effect</th>
<th>Criteria: Severity of effect on product (Manufacturing/assembly effect)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to Meet safety and/or Regularity Requirements</td>
<td>Potential failure mode affects safe vehicle operation and/or involves noncompliance with government regulation without warning</td>
<td>10</td>
<td>Failure to meet safety and/or Regulatory Requirements</td>
<td>May endanger operator (machine or assembly) with out warning</td>
</tr>
<tr>
<td>Loss or Degradation of Primary Function</td>
<td>Loss of primary function (vehicle inoperable, does not affect safe vehicle operation)</td>
<td>8</td>
<td>Major Disruption</td>
<td>100% of product may have to be scrapped. Line shutdown or stop ship</td>
</tr>
<tr>
<td>Loss or Degradation of Secondary Function</td>
<td>Degradation of primary function (vehicle operable, but at reduced level of performance)</td>
<td>7</td>
<td>Significant Disruption</td>
<td>A portion of the production run may have to be scrapped. Deviation from primary process including decreased line speed or added man power.</td>
</tr>
<tr>
<td>Loss or Degradation of Secondary Function</td>
<td>Loss of secondary function (vehicle operable, but comfort/convenience functions inoperable)</td>
<td>6</td>
<td>Moderate Disruption</td>
<td>100% of production run may have to be reworked offline and accepted</td>
</tr>
<tr>
<td>Loss or Degradation of Secondary Function</td>
<td>Degradation of secondary function (vehicle operable, but comfort/convenience functions at reduced level of performance)</td>
<td>5</td>
<td>Moderate Disruption</td>
<td>A portion of production run may have to be reworked offline and accepted</td>
</tr>
<tr>
<td>Annoyance</td>
<td>Appearance or Audible noise, vehicle operable, item does not conform and noticed by most customers (&gt;75%)</td>
<td>4</td>
<td>Moderate Disruption</td>
<td>100% of production run may have to be reworked in station before it is processed</td>
</tr>
<tr>
<td>Annoyance</td>
<td>Appearance or Audible noise, vehicle operable, item does not conform and noticed by most customers (50%)</td>
<td>3</td>
<td>Moderate Disruption</td>
<td>A portion of the production run may have to be reworked in station before it is processed</td>
</tr>
<tr>
<td>Annoyance</td>
<td>Appearance or Audible noise, vehicle operable, item does not conform and noticed by most customers (&lt;25%)</td>
<td>2</td>
<td>Minor Disruption</td>
<td>Slight inconvenience to process, operation, or operator.</td>
</tr>
<tr>
<td>No effect</td>
<td>No discernible effect</td>
<td>1</td>
<td>No Effect</td>
<td>No discernible effect</td>
</tr>
</tbody>
</table>

### Occurrence Scale Rating

<table>
<thead>
<tr>
<th>Probability of Failure</th>
<th>Criteria: Occurrence of Cause - PFMEA (Incidents per item/product)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>&gt;= 100 Per thousand</td>
<td>10</td>
</tr>
<tr>
<td>Very High</td>
<td>&gt;= 1 in 10</td>
<td></td>
</tr>
<tr>
<td>Very High</td>
<td>50 per thousand</td>
<td>9</td>
</tr>
<tr>
<td>Very High</td>
<td>1 in 20</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>20 per thousand</td>
<td>8</td>
</tr>
<tr>
<td>High</td>
<td>1 in 50</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>10 per thousand</td>
<td>7</td>
</tr>
<tr>
<td>High</td>
<td>1 in 100</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>1 in 500</td>
<td>6</td>
</tr>
<tr>
<td>Moderate</td>
<td>2 per thousand</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>5 per thousand</td>
<td>5</td>
</tr>
<tr>
<td>Moderate</td>
<td>1 in 2000</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>1 per thousand</td>
<td>4</td>
</tr>
<tr>
<td>Moderate</td>
<td>1 in 10000</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>.01 per thousand</td>
<td>3</td>
</tr>
<tr>
<td>Low</td>
<td>1 in 100000</td>
<td></td>
</tr>
<tr>
<td>Very Low</td>
<td>&lt;= .001 per thousand</td>
<td>2</td>
</tr>
<tr>
<td>Very Low</td>
<td>1 in 1000000</td>
<td></td>
</tr>
<tr>
<td>Very Low</td>
<td>Failure is eliminated through preventive control</td>
<td>1</td>
</tr>
</tbody>
</table>
Detection Scale Rating

<table>
<thead>
<tr>
<th>Opportunity for Detection</th>
<th>Criteria: Likelihood of Detection by process control</th>
<th>Rank</th>
<th>Likelihood of Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Detection opportunity</td>
<td>No current process control; Cannot detect or is not analyzed</td>
<td>10</td>
<td>Almost Impossible</td>
</tr>
<tr>
<td>Not likely to detect at any stage</td>
<td>Failure Mode and/or Error (Cause) is not easily detected (e.g., random audits)</td>
<td>9</td>
<td>Very Remote</td>
</tr>
<tr>
<td>Problem Detection Post Processing</td>
<td>Failure Mode detection post - processing by operator through visual/tactile/audible means.</td>
<td>8</td>
<td>Remote</td>
</tr>
<tr>
<td>Problem Detection at Source</td>
<td>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/clacker wrench, etc.)</td>
<td>7</td>
<td>Very Low</td>
</tr>
<tr>
<td>Problem Detection Post Processing</td>
<td>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/clacker wrench, etc.)</td>
<td>6</td>
<td>Low</td>
</tr>
<tr>
<td>Problem Detection at Source</td>
<td>Failure Mode or Error (Cause) detection in station by operator through use of variable gauging or by automated controls in station that will detect discrepant part and notify operator (light, buzzer, etc.). Gauging performed on setup and first-piece check</td>
<td>5</td>
<td>Moderate</td>
</tr>
<tr>
<td>Problem Detection Post Processing</td>
<td>Failure Mode detection post-processing by automated controls that will detect discrepant part and lock part to prevent further processing</td>
<td>4</td>
<td>Moderately High</td>
</tr>
<tr>
<td>Problem Detection at Source</td>
<td>Failure Mode detection in station by automated controls that will detect discrepant part and automatically lock part in station to prevent further processing</td>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>Error Detection and/or problem prevention</td>
<td>Error (Cause) detection in station by automated controls that will detect error and prevent discrepant part from being made</td>
<td>2</td>
<td>Very High</td>
</tr>
<tr>
<td>Detection not applicable, Error prevention</td>
<td>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</td>
<td>1</td>
<td>Almost Certain</td>
</tr>
</tbody>
</table>

FIG 26

STEP 9
Analyzing the FMEA

Sort by RPN to determine the most significant failure modes

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

<table>
<thead>
<tr>
<th>Process Step</th>
<th>Potential Failure Mode</th>
<th>Potential Effect(s) of Failure</th>
<th>RPN</th>
<th>Recommended Actions</th>
<th>Responsibility &amp; Target Date</th>
<th>Action Results</th>
<th>Actions Taken</th>
<th>Score</th>
<th>Delta</th>
<th>RPN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Op 70: Manual application of wax inside door panel</td>
<td>Insufficient wax coverage over specified surface</td>
<td>Allows integrity breach of inner door panel</td>
<td>280</td>
<td>Add positive depth stop to sprayer</td>
<td>Mg. Eng. By 5/10/10</td>
<td>Stop added, sprayer checked on-line</td>
<td>7 2 5 70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Automate spraying</td>
<td>Mg. Eng. By 5/25/10</td>
<td>Rejected due to complexity of different doors on the same line</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Use DOE on viscosity vs. temp vs. pressure</td>
<td>Mg. Eng. By 5/31/10</td>
<td>Temp and press limits were determined and limit controls have been installed - Control charts show process is in control Cpk = 1.85</td>
<td>7 1 5 35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FIG 28
• 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:

**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, Xls, and TIF etc.
Control Plan explanation: - Refer FIG 31 and FIG 32

### FIG 31

<table>
<thead>
<tr>
<th>Control Plan Number</th>
<th>Part Number</th>
<th>Part Rev</th>
<th>Supplier / Plant Approval / Date</th>
<th>Customer Engineering Approval / Date (if Req’d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>484.010020</td>
<td>A</td>
<td></td>
<td>Other Approval / Date (if Req’d)</td>
<td>Customer Quality Approval / Date (if Req’d)</td>
</tr>
</tbody>
</table>

**Part process number & Process name or description:**
Process number as per sequence and Process description in the first 2 columns.

**Characteristics:**
Define the characteristics of the product or process involved in the process.

**Special Characteristics:**
All significant or special characteristics present in the process to be marked with a symbol.

**Product / Process Specifications/Tolerance:**
Use this area to define upper/lower spec limits for each control element.

**Measurement Technique:**
For each line in the control plan, list the measurement procedure that will be used (may list R&R Gage Plan or Poka-Yoke), area to define upper/lower spec limits for each control element.

**Sample Size:**
What is the size of the sample you should gather data from?

**Frequency:**
Define the frequency for which the measurement will be taken.

**Machine, Device header:**
List the machine, device, jig, or tools that will be used in the process.

**Administrative Section**
Identifies Control plan number (unique number), Part number, Revision change level, Part description, CFT, Supplier name, required approval signatures, and dates.

### FIG 32

**Control Method**
Method that will be used to control the process.

**Responsibility**
Person responsible for the control and evaluation of the part produced in the process.

**Reaction Plan**
Actions to be taken if controls fail.

**Prototype**
A description of the dimensional measurements and material and performance tests that will occur during Prototype build.

**Pre-Launch**
A description of the dimensional measurements and material and performance tests that will occur after Prototype and before full Production.

**Production**
A comprehensive documentation of product/process characteristics, process controls, tests, and measurement systems that will occur during mass production.
Control plan – Example: - Refer 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.

<table>
<thead>
<tr>
<th>Process No.</th>
<th>Process Name</th>
<th>Machine Tool No.</th>
<th>Stage</th>
<th>Product</th>
<th>Process Description</th>
<th>Tool / Jig / Machine Used</th>
<th>Measuring Instrument Used for Qualifying the Product Parameter</th>
<th>Person Responsible for Process Qualification at That Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>Forming</td>
<td>M/c100T</td>
<td>3/4</td>
<td>Dimension 1</td>
<td>Appearance</td>
<td>260 - 290</td>
<td>X-bar chart and Gauge R &amp; R</td>
<td>External Inspector</td>
</tr>
</tbody>
</table>

FIG 33
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

![FIG 38](image1)

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

![FIG 39](image2)

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

![FIG 40](image3)
**Step 6**

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

**FIG 41**

**Step 7**

Observe the calculated values of:

- % Repeatability (EV)
- % Reproducibility (AV)
- % Repeatability & Reproducibility (R&R)

**Acceptance Criteria for R & R**

<table>
<thead>
<tr>
<th>Result Interpretation</th>
<th>Acceptance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted (&lt;= 10%)</td>
<td>Instrument can be used for Capability study</td>
</tr>
<tr>
<td>Conditionally Accepted (10 to 30% incl)</td>
<td>Instrument should not be used for Capability study</td>
</tr>
<tr>
<td>Rejected (Above 30%)</td>
<td>Instrument should not be used for any measurement</td>
</tr>
</tbody>
</table>

**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](image-url)
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

<table>
<thead>
<tr>
<th>Print zone or Balloon Draw Ref</th>
<th>Nominal Value</th>
<th>Tol ±</th>
<th>Tol -</th>
<th>USL</th>
<th>LSL</th>
<th>Measuring Instrument</th>
<th>Samples</th>
<th>Pass/Fail</th>
<th>NCR approval for Out of spec AND/OR Cpk Failed dimensions Provide RFC Ref no</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td>9</td>
<td>0.1</td>
<td>0.1</td>
<td>9.1</td>
<td>8.9</td>
<td>Vernier Caliper</td>
<td>9.05</td>
<td>PASS</td>
<td>6300PC001000</td>
</tr>
<tr>
<td>B4</td>
<td>9</td>
<td>0.1</td>
<td>0.1</td>
<td>9.1</td>
<td>8.9</td>
<td>Micrometer</td>
<td>8.8</td>
<td>PASS</td>
<td>6300PC001000</td>
</tr>
</tbody>
</table>

**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.

**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](image)

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

Example given below:

![Example Image](image)

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
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 $Cpk \geq 1.67$. 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

   $\phi 6.25 \pm 0.25$

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

   $/ / 0.05 C$

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.

   `INSERT PULL-OUT: 12 IN*LBS. TORQUE MINIMUM`

   `PUSH-OUT FORCE TO BE 650N MIN. TORQUE-OUT FORCE TO BE 1.3Nm MIN.`
You need to select the Tolerance category by drop down menu.

<table>
<thead>
<tr>
<th></th>
<th>Tolerance Category</th>
<th>Cpk</th>
<th>Cpk</th>
<th>Pass/Fail</th>
<th>NCR approval for Out of spec AND/OR Cpk Failed dimensions Provide RFC Ref no</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>General Tolerance</td>
<td>91.287</td>
<td>91.226</td>
<td>Pass</td>
<td>NA</td>
</tr>
<tr>
<td>B</td>
<td>Geometric Tolerance</td>
<td>15.215</td>
<td>12.232</td>
<td>Pass</td>
<td>NA</td>
</tr>
<tr>
<td>C</td>
<td>Others</td>
<td>2.086</td>
<td>2.317</td>
<td>Pass</td>
<td>NA</td>
</tr>
<tr>
<td>D</td>
<td>General Tolerance</td>
<td>0.000</td>
<td>0.000</td>
<td>Pass</td>
<td>0</td>
</tr>
</tbody>
</table>

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 $\text{Cpk} \geq 1.67$ 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:**

![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.
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.

![Material Test Report](image)

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.
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](image)

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](image)
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

10b. Performance Test Results

NOTE: If you need assistance to fill the sheet, Please refer “Section 9” of PPAP USER GUIDE

<table>
<thead>
<tr>
<th>Part Number</th>
<th>484-0100201</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Name</td>
<td>Pulley Roller</td>
</tr>
<tr>
<td>Part Rev</td>
<td>A</td>
</tr>
<tr>
<td>Supplier Name</td>
<td>ABC PVT LTD</td>
</tr>
</tbody>
</table>

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

![RoHS/WEEE Compliance Declaration Format](image1)

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](image2)

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.

---

**13. Appearance Report**

**Note:** If you need assistance to fill the sheet, Please refer “Section 12” of PPAP USER GUIDE

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>484 010029</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part Name</td>
<td>Pulley Roller</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part Rev</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier Name</td>
<td>ABC India PVT Ltd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part Image and Part Marking details (like Recycle Symbol, Part no, UL no, Moulders name etc.)**

Attach the part Picture below

![Part Images](attachment:image1.png)

![Part Images](attachment:image2.png)

![Part Images](attachment:image3.png)

![Part Images](attachment:image4.png)

**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.

<table>
<thead>
<tr>
<th>Adhesion Test Results for Painted Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing Standard</td>
</tr>
<tr>
<td>☐ A</td>
</tr>
<tr>
<td>ADHESION CONFIRM TO ASTM D-3359: RATING 5</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>RAL Shade Card details for Painted Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attach the Shade card Picture below</td>
</tr>
<tr>
<td>☐ A</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

FIG 55

A – Attach the RAL Shade card image (Example: Trinite 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

<table>
<thead>
<tr>
<th>UL Certification (Attach the Report below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawing specified UL no</td>
</tr>
<tr>
<td>☐ A</td>
</tr>
<tr>
<td>V2 or Better</td>
</tr>
</tbody>
</table>

FIG 56
A – Specify the drawing called UL rating
B – Enter the supplier used UL rating
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

<table>
<thead>
<tr>
<th>SI No</th>
<th>Drawing Notes</th>
<th>Measurement value/Confirmation</th>
<th>Remarks if any</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flash Permitted upto 0.1 mm</td>
<td>0.95 mm</td>
<td>OK</td>
</tr>
<tr>
<td>2</td>
<td>Ejector Pin Marks 0.1 mm Depressed</td>
<td>0.1 mm</td>
<td>OK</td>
</tr>
<tr>
<td>3</td>
<td>Draft for other surfaces 10 deg Max</td>
<td>1 Deg Max</td>
<td>OK</td>
</tr>
<tr>
<td>4</td>
<td>General Surface as produced by SPI/SPM Mould Finish</td>
<td>Confirmed</td>
<td>OK</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Pulley Roller</th>
<th>Part Rev</th>
<th>Supplier Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>484.0100201</td>
<td></td>
<td>A</td>
<td>ABC PVT LTD</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Gauge / Instrument Name</th>
<th>ID of Gauge / Instrument</th>
<th>Calibrated On (Date)</th>
<th>Next Calibration Due Date</th>
<th>Remarks if any</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vernier Caliper</td>
<td>VC 001/QC</td>
<td>1-Jan-13</td>
<td>31-Dec-13</td>
<td></td>
</tr>
</tbody>
</table>

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](image)

---

**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

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Part no</th>
<th>Rev</th>
<th>Description</th>
<th>Process/Operation Name</th>
<th>Sub Supplier Name</th>
<th>Supplier Part Number (if any)</th>
<th>Rev</th>
<th>Sub Supplier Location</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>1</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>1</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>1</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>1</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>1</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>1</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>1</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>1</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>E</td>
<td>1</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>1</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>1</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>1</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>G</td>
<td>1</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>1</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>H</td>
<td>1</td>
<td>H</td>
<td>H</td>
<td>H</td>
<td>H</td>
<td>1</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I</td>
<td>1</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>1</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>J</td>
<td>1</td>
<td>J</td>
<td>J</td>
<td>J</td>
<td>J</td>
<td>1</td>
<td>J</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>K</td>
<td>1</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>1</td>
<td>K</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>L</td>
<td>1</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>1</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>1</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>N</td>
<td>1</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>1</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

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

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
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

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

<table>
<thead>
<tr>
<th>SUBMISSION RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts / Samples meet all drawing specifications and Other Requirements of NCR (Tick appropriate box)</td>
</tr>
<tr>
<td>If “No” - Explanation Required</td>
</tr>
<tr>
<td>Production Process</td>
</tr>
<tr>
<td>Tool/Mold Target Life</td>
</tr>
<tr>
<td>Actual Tool Life</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>DECLARATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>I affirm that the samples represented by this warrant are representative of our parts now and in the future.</td>
</tr>
<tr>
<td>I further affirm that we understand any change to material or process in the production of these parts must be approved by NCR before implementation.</td>
</tr>
<tr>
<td>I also certify that documented evidence of such compliance for this submission level is on file and available for review.</td>
</tr>
<tr>
<td>I have noted any deviations from this declaration below.</td>
</tr>
</tbody>
</table>

Explanation / Comments If any:

---

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.

<table>
<thead>
<tr>
<th>PPAP DISPOSITION STATUS (FOR NCR USE ONLY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPAP Production Warrant Disposition Status:</td>
</tr>
<tr>
<td>RFC or deviation approval/ref if any</td>
</tr>
<tr>
<td>Approved under 53RFC21592</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>PPAP WITHDRAWAL IF ANY</th>
<th>FOR NCR USE ONLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPAP Approval Withdrawn by</td>
<td>S.Karthikeyan</td>
</tr>
<tr>
<td>Reason for withdrawal</td>
<td>20-Jun-12</td>
</tr>
</tbody>
</table>

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

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