PPAP 4th Edition

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The Process Approach

PPAP 4th Edition has been revised to be consistent with the Process Approach of ISO/TS 16949…
Process Model
ISO 9001:2000 Model of a Process-Based Quality Management System

Continual improvement of The quality management system

Customers

Requirements

Input

Product realization

Product

Output

Satisfaction

Management responsibility

Measurement, analysis and improvement

Resource Management
Process (Typical)

INPUT
Customer who has a need

OUTPUT
Customer who has a need met

Input

Step 1

Step 2

Step 3

Step “N”

Output
PPAP Process Flow

An Example

ORGANIZATION

- Project Owner & Team
- Completion of PPAP Required Items
- Submission (or Resubmission) of PPAP Warrant
- Completion of PSW
- Approved PSW
- Supplier Initiated Changes
- PPAP Table 4.1 Records
- Gather Information

CUSTOMER

- Customer Purchase Order / Customer-Specific Requirements
- Customer Part Design Requirements
- Customer Process Design Requirements
- Customer Specifications
- Customer Logistics Requirements

CUSTOMER

- Record of Approved PSW
- Receipt and Approval of Submitted PSW
- Validated Process [PSO / Run at Rate]
- Customer Initiated Changes to Part, Specifications, etc.
Critical Elements of the Process Approach

- Process owner exists
- Process is defined
- Process is documented
- Linkages of process established
- Process monitored, analyzed and improved
- Records maintained
PPAP’s purpose continues to be to provide the evidence that all customer engineering design record and specification requirements are properly understood by the organization and that the process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate.
Applicability

PPAP shall apply to internal and external organization sites (see Glossary) of bulk materials, production materials, production or service parts.

For bulk materials, PPAP is not required unless specified by the authorized customer representative.*

*Ford Motor requires PPAP of Bulk Material Suppliers.
Approach

The word “should” now indicates a recommendation

For purposes of PPAP, the terms and definitions given in ISO/TS 16949 and the PPAP Glossary apply
Effective Date

The PPAP Fourth Edition replaces the Third Edition effective...

June 1, 2006

unless otherwise specified by your customer.
Changes in the 4th Edition

The Fourth Edition of PPAP includes the following changes:

• Identified issues in the application of PPAP
• Removal of QS-9000 references
• Necessary edits including typographical or grammatical corrections
Changes in the 4th Edition

• Alignment of PPAP to the ISO/TS 16949:2002 process approach, including:
  – Aligning the order of the PPAP requirements with the automotive product development and manufacturing process
  – Inclusion of an example process flow for PPAP
Changes in the 4th Edition

• Relocation of Customer Specific Instructions to the appropriate websites, (e.g. OEM portals, AIAG site @ www.aiag.org, and IAOB site @ www.iaob.org) to provide current requirements
Changes in the 4th Edition

- Update of Truck OEM requirements … moved to Appendix H
Changes in the 4th Edition

- Alignment of PPAP 4th Edition terminology to the ISO/TS 16949:2002 terminology...

<table>
<thead>
<tr>
<th>PPAP 3rd QS 9000</th>
<th>PPAP 4th ISO/TS 16949:2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer</strong></td>
<td>← - - Customer</td>
</tr>
<tr>
<td><strong>Supplier</strong></td>
<td>← - - Tier 1</td>
</tr>
<tr>
<td><strong>Subcontractor</strong></td>
<td>← - - Tier 2+</td>
</tr>
</tbody>
</table>

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Changes in the 4th Edition

- Updated specific PPAP requirements, including:
  - Materials reporting and polymeric part identification requirements
  - Process capability index usage ($C_{pk}$ and $P_{pk}$)
  - The definition and approval of catalog parts and the definition of black box parts
Changes in the 4th Edition

- Modified customer notification and submission requirements to align with OEM requirements (e.g., Section I.3.3 and Table I.3.3 from PPAP 3rd was removed)
  - This means no more “loopholes”...
Changes in the 4th Edition

Customer Notification is now required for ALL proposed changes
Changes in the 4th Edition

• Clarified and commonized Appendices C, D, and E to match the PPAP reporting requirements
  – Production Part Approval, Dimensional Results Form
  – Production Part Approval, Material Test Results Form
  – Production Part Approval, Performance Test Results Form

• Actual test data is required
  – “Blanket statements of conformance are unacceptable for any test results”
Changes in the 4th Edition

- Revised Tire Appendix to allow OEM specification of applicability and to eliminate duplications with allowances already provided in the PPAP requirements

*Note: The Tire Appendix is not applicable to organizations supplying tires to Ford Motor Company.*
Changes in the 4th Edition

• Reorganized and updated Appendix F to stress the importance of the Bulk Materials Checklist

Note: Ford Motor Company requires all organizations supplying bulk material to Ford Motor Company to comply with PPAP.
Changes in the 4th Edition

• Revised Table Of Contents
# TABLE OF CONTENTS

- **INTRODUCTION**
- SECTION 1 – GENERAL
- SECTION 2 – PPAP PROCESS REQUIREMENTS
- SECTION 3 – CUSTOMER NOTIFICATION AND SUBMISSION REQUIREMENTS
- SECTION 4 – SUBMISSION TO CUSTOMER - LEVELS OF EVIDENCE
- SECTION 5 – PART SUBMISSION STATUS
- SECTION 6 – RECORD RETENTION
- Appendix A – Completion of the Part Submission Warrant (PSW)
- Appendix B – Completion of the Appearance Approval Report
- Appendix C – Production Part Approval, Dimensional Results
- Appendix D – Production Part Approval, Material Test Results
- Appendix E – Production Part Approval, Performance Test Results
- Appendix F – Bulk Material - Specific Requirements
- Appendix G – Tires - Specific Requirements
- Appendix H – Truck Industry - Specific Requirements
- GLOSSARY
Changes in the 4th Edition

- Reorder of PPAP Process Requirements (Section 2)
PPAP Process Requirements

The organization shall also meet all customer-specific instructions

- 2.2.1 Design Record
- 2.2.2 Authorized Engineering Change documents
- 2.2.3 Customer Engineering Approval
- 2.2.4 Design Failure Mode and Effects Analysis (Design FMEA)
- 2.2.5 Process Flow Diagram(s)
- 2.2.6 Process Failure Mode and Effects Analysis (Process FMEA)
- 2.2.7 Control Plan
- 2.2.8 Measurement System Analysis Studies
- 2.2.9 Dimensional Results
- 2.2.10 Records of Material / Performance Test Results
- 2.2.11 Initial Process Studies
- 2.2.12 Qualified Laboratory Documentation
- 2.2.13 Appearance Approval Report (AAR)
- 2.2.14 Sample Production Parts
- 2.2.15 Master Sample
- 2.2.16 Checking Aids
- 2.2.17 Customer-Specific Requirements
- 2.2.18 Part Submission Warrant (PSW)
Changes in the 4th Edition

• Revised Glossary to be consistent with the updates in the text
Glossary
Aligned, Revised, and Simplified

• Deletions:
  Agreement
  Critical Characteristic (both Ford and GM definitions)
  Customer Product Approval Activity
  Documentation
  Environment
  Full Approval
  Gage Repeatability & Reproducibility (Gage R&R)
  Initial Sample
  Interim Approval
Glossary
Aligned, Revised, and Simplified

• Deletions (continued)

  Key Characteristics (All four)
  MSA Studies
  Rejected
  Remote Location
  Repeatability and Reproducibility
  Safety Characteristics
  Self Certifying Supplier
  Subcontractor
  Tooling Maintenance
  Tooling Refurbishment
Glossary
Aligned, Revised, and Simplified

- Revised:
  - Approved
  - Attribute Data
  - Customer
  - Initial Process Study
  - Part Submission Warrant
  - Process
  - Process Flow Diagram
  - Quality Indices
  - Saleable Product
Glossary
Aligned, Revised, and Simplified

• Revised (continued):
  Significant Production Run
  Site
  Special Characteristics
  Specification
  Stable Process
  Suppliers
  Statistical Control
  Submission Level
  Variables Data
Glossary
Aligned, Revised, and Simplified

• Added:
  Authorized Customer Representative(s)
  Black Box
  Organization
  Production Rate
**PSW**

Revised and Reorganized
Part Submission Warrant

- Revised PSW (Part Submission Warrant) to:
  - Provide a more logical flow for the part information description fields...
<table>
<thead>
<tr>
<th>Part Submission Warrant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part Name</strong></td>
</tr>
<tr>
<td><strong>Shown on Drawing Number</strong></td>
</tr>
<tr>
<td><strong>Engineering Change Level</strong></td>
</tr>
<tr>
<td><strong>Additional Engineering Changes</strong></td>
</tr>
<tr>
<td><strong>Safety and/or Government Regulation</strong></td>
</tr>
<tr>
<td><strong>Checking Aid Number</strong></td>
</tr>
</tbody>
</table>

**PART INFORMATION**

1. **Part Name and 2a. Customer Part Number**: Engineering released finished end item part name and number.
2b. **Org, Part Number**: Part number defined by the organization, if any.
3. **Shown on Drawing Number**: The design record that specifies the customer part number being submitted.
4. **Engineering Change Level & Date**: Show the change level and date of the design record.
5. **Additional Engineering Changes & Date**: List all authorized engineering changes not yet incorporated in the design record but which are incorporated in the part.
<table>
<thead>
<tr>
<th>Part Name</th>
<th>Cust. Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shown on Drawing Number</td>
<td>Orig. Part Number</td>
</tr>
<tr>
<td>Engineering Change Level</td>
<td>Dated</td>
</tr>
<tr>
<td>Additional Engineering Changes</td>
<td>Dated</td>
</tr>
<tr>
<td>Safety and/or Government Regulation</td>
<td>Purchase Order No.</td>
</tr>
<tr>
<td>Checking Aid Number</td>
<td>Checking Aid Eng. Change Level</td>
</tr>
</tbody>
</table>

**PART INFORMATION**

6. Safety and/or Government Regulation: “Yes” if so indicated by the design record, otherwise “No.”
7. Purchase Order Number: Enter this number as found on the contract/purchase order.
8. Weight: Enter the actual weight in kilograms to four decimal places unless otherwise specified by the customer.
9./10. Checking Aid Number, Change Level and Date: If requested by the customer, enter the checking aid number, its change level and date.
Part Submission Warrant

• Revised PSW (Part Submission Warrant) to:
  – Make the supplier address fields applicable to international locations...
<table>
<thead>
<tr>
<th>ORGANIZATION MANUFACTURING INFORMATION</th>
<th>CUSTOMER SUBMITTAL INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Organization Name &amp; Supplier/Vendor Code</td>
<td>13. Customer Name/Division</td>
</tr>
<tr>
<td>Street Address</td>
<td>14. Buyer/Buyer Code</td>
</tr>
<tr>
<td>City Region Postal Code Country</td>
<td>15. Application</td>
</tr>
</tbody>
</table>

- **ORGANIZATION MANUFACTURING INFORMATION**
  11. Organization Name & Supplier/Vendor Code: Show the name and code assigned to the manufacturing site on the purchase order/contract.
  12. Street Address, Region, Postal Code, Country: Show the complete address of the location where the product was manufactured. For “Region,” enter state, county, province, etc.

- **CUSTOMER SUBMITTAL INFORMATION**
  13. Customer Name/Division: Show the corporate name and division or operations group.
  14. Buyer/Buyer Code: Enter the buyer’s name and code.
  15. Application: Enter the model year, vehicle name, engine, transmission, etc.
Part Submission Warrant

- Revised PSW (Part Submission Warrant) to:
  - Include IMDS materials reporting to indicate reporting status…
  - Polymeric parts identification requirements…
MATERIALS REPORTING

Has customer-required Substances of Concern information been reported?

Submitted by IMDS or other customer format:

Are polymeric parts identified with appropriate ISO marking codes?

• MATERIALS REPORTING

16. Substances of Concern: Enter “Yes,” “No,” or “n/a”.
IMDS/Other Customer Format: Circle either “IMDS” or “Other Customer Format” as appropriate.
If submitted via IMDS include: Module ID #, Version #, and Creation Date.
If submitted via other customer format, enter the date customer confirmation was received.

17. Polymeric Parts Identification: Enter “Yes,” “No,” or “n/a”.
Part Submission Warrant

• Reason For Submission...
• **REASON FOR SUBMISSION**
  18. Check the appropriate box(es). For bulk materials, in addition to checking the appropriate box, check “Other” and write “Bulk Material” in the space provided.
Part Submission Warrant

• Submission Level...
REQUESTED SUBMISSION LEVEL (Check one)

- Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
- Level 2 - Warrant with product samples and limited supporting data submitted to customer.
- Level 3 - Warrant with product samples and complete supporting data submitted to customer.
- Level 4 - Warrant and other requirements as defined by customer.
- Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.

19. SUBMISSION LEVEL: Identify the submission level requested by the customer.
Part Submission Warrant

• Submission Results…
SUBMISSION RESULTS

The results for dimensional measurements, material and functional tests, appearance criteria, and statistical process package meet all design record requirements: Yes NO

Molds/Cavities/Production Process

20. Check the appropriate boxes for dimensional, material tests, performance tests, appearance evaluation, and statistical data.

21. Check the appropriate box. If “no,” enter the explanation in “comments” below.

22. Molds/Cavities/Production Processes: For instruction, see paragraph 2.2.18
Part Submission Warrant

• Declaration…
DECLARATION
I affirm that the samples represented by this warrant are representative of our parts, which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 23/24 hours. I also certify that documented evidence of such compliance is on file and available for your review. I have noted any deviation from this declaration below.

EXPLANATION/COMMENTS:

23. Enter the number of pieces manufactured during the significant production run.
24. Enter the time (in hours) taken for the significant production run.
25. EXPLANATION/COMMENTS: Provide any explanatory comments on the Submission Results or any deviations from the Declaration. Attach additional information as appropriate.
DECLARATION
I affirm that the samples represented by this warrant are representative of our parts, which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of ____/____ hours. I also certify that documented evidence of such compliance is on file and available for your review. I have noted any deviation from this declaration below.

EXPLANATION/COMMENTS: ________________________________________________________________

Is each Customer Tool properly tagged and numbered? □ Yes □ No □ n/a 26

Organization Authorized Signature __________________________ Date ________________
Print Name ___________________________ Phone No. ___________________________ Fax No. ___________________________
Title ___________________________ E-mail ___________________________

• DECLARATION
26 CUSTOMER TOOL TAGGING/NUMBERING: Are customer-owned tools identified in accord with ISO/TS 16949 and any customer-specific requirements, answer “Yes” or “No.” May not be applicable to OEM internal suppliers.
27 ORGANIZATION AUTHORIZED SIGNATURE: A responsible organization official, after verifying that the results show conformance to all customer requirements and that all required documentation is available, shall approve the declaration and provide Title, Phone Number, Fax Number, and E-mail address.
<table>
<thead>
<tr>
<th>FOR CUSTOMER USE ONLY (IF APPLICABLE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPAP Warrant Disposition:</td>
</tr>
<tr>
<td>Customer Signature</td>
</tr>
<tr>
<td>Print Name</td>
</tr>
</tbody>
</table>

- **FOR CUSTOMER USE ONLY** (Leave blank)
Changes in the 4th Edition - Bottom Line

• Sustained improvement at the OEM manufacturing and assembly centers…
  – Warranty reduction
  – Elimination of supplier disruptions
  – Significant improvement in delivered part quality
  – Continual quality system improvement