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Production Part Approval Process

PPAP
Fourth Edition



Production Part Approval Process (PPAP)

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DaimlerChrysler Corporation, Ford Motor Company, General Motors Corporation

**Effective June 1, 2006, PPAP Fourth Edition replaces PPAP Third Edition
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PPAP (Production Part Approval Process) 4th Edition Errata Sheet

<u>Page</u>	<u>Original Language (see highlight)</u>	<u>Corrected Version Language or explanation</u>
ii	PPAP Process Flowchart Example	The flowchart is an example, and is not meant to be interpreted to represent the only possible process flow for PPAP. This is not a mandatory process flow.
ii	Validated Process [PSO / Run at Rate]	PSO or Run at Rate may be required by certain OEMs or other customers prior to PPAP Warrant submission.
22	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.	IMDS/Other Customer Format: Circle either "IMDS" or "Other Customer Format" as appropriate. If submitted via IMDS include: Module ID #, Version #, and Date Transmitted to the customer, and all other information as required by the customer specifics. If submitted via other customer format, enter the date customer confirmation was received.
23	Has customer-required Substances of Concern information been reported? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	Reporting of all materials, not just Substances of Concern, may be required by certain OEMs or other customers
23	Has customer-required Substances of Concern information been reported? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	Has customer-required Substances of Concern information been reported? <input type="checkbox"/> Yes <input type="checkbox"/> No
23	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.	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.
28	SUPPLIER NAME (item 8, as indicated on page 27)	ORGANIZATION NAME
50	SUPPLIER/VENDOR CODE (line 3)	ORGANIZATION (VENDOR) CODE
51	SUPPLIER NAME (item 1)	ORGANIZATION NAME
51	SUPPLIER CODE (item 3)	ORGANIZATION (VENDOR) CODE
52	SUPPLIER NAME (item 1 as indicated on page 51)	ORGANIZATION NAME
52	SUPPLIER CODE (item 3 as indicated on page 51)	ORGANIZATION (VENDOR) CODE

FOREWORD TO THE FOURTH EDITION

Effective June 1, 2006, **PPAP** Fourth Edition replaces **PPAP** Third Edition, unless otherwise specified by your customer.

Production Part Approval Process (PPAP) is updated to the 4th edition to incorporate the customer focused process approach associated with ISO/TS 16949:2002 and other changes listed below to update requirements.

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 manufacturing process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate.

PPAP 4th Edition includes the following changes:

- 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**
- Relocation of Customer Specific Instructions to appropriate websites, (e.g. OEM and IAOB, www.iaob.org) to provide current requirements
- Update of Truck OEM requirements and moved to Appendix H
- Revised PSW (Part Submission Warrant) to:
 - ♦ Provide a more logical flow for the part / design description fields
 - ♦ Make the supplier address fields applicable to international locations
 - ♦ Include IMDS materials reporting to indicate reporting status
- Updated specific **PPAP** requirements, including:
 - ♦ Materials reporting and polymeric identification requirements in the design record
 - ♦ Process capability index usage (Cpk and Ppk)
 - ♦ The definition and approval of catalog parts and the definition of black box parts
- Modified customer notification and submission requirements to align with OEM requirements (e.g., I.3.3 from **PPAP** 3rd removed)
- Clarified and commonized Appendices C, D, and E to match the **PPAP** reporting requirements
- 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.
- 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**.
- Revised Glossary to be consistent with the updates in the text

PPAP refers to the following reference manuals: **Advanced Product Quality Planning & Control Plan**, **Potential Failure Modes and Effects Analysis**, **Measurement System Analysis**, and **Statistical Process Control**. These manuals are authored by DaimlerChrysler Corporation, Ford Motor Company, and General Motors Corporation and are available through the Automotive Industry Action Group (AIAG) at www.aiag.org.

The Supplier Quality Requirements Task Force gratefully acknowledges the contributions of the many individuals and their respective companies that participated in the revision process.

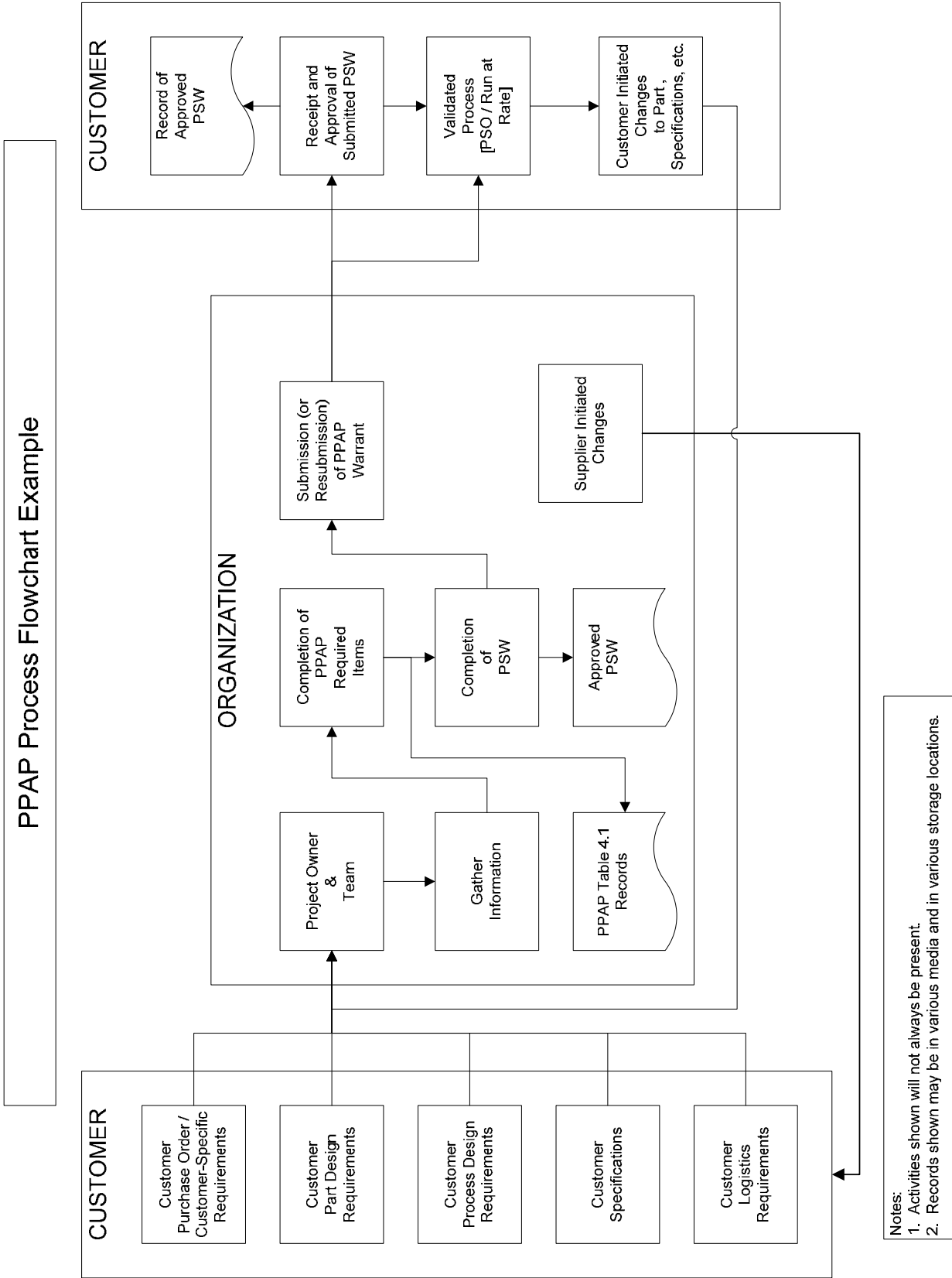


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INTRODUCTION

Purpose

Production Part Approval Process (PPAP) defines generic requirements for production part approval, including production and bulk materials (see Glossary). The purpose of **PPAP** is to determine if all customer engineering design record and specification requirements are properly understood by the organization and that the manufacturing 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) supplying production parts, service parts, production materials, or bulk materials. For bulk materials, **PPAP** is not required unless specified by the authorized customer representative.

An organization supplying standard catalog production or service parts shall comply with **PPAP** unless formally waived by the authorized customer representative.

NOTE 1: See customer-specific requirements for additional information. All questions about **PPAP** should be addressed to the authorized customer representative.

NOTE 2: A customer can formally waive **PPAP** requirements for an organization. Such waivers can only be issued by an authorized customer representative.

NOTE 3: An organization or supplier requesting a waiver of a **PPAP** requirement should contact the authorized customer representative. The organization or supplier should obtain documentation of waivers from the authorized customer representative.

NOTE 4: Catalog parts (e.g., bolts) are identified and/or ordered by functional specifications or by recognized industry standards.

Approach

The word “shall” indicates mandatory requirements. The word “should” indicates a recommendation.

Paragraphs marked “**NOTE**” are for guidance in understanding or clarifying the associated requirement. The word “should” appearing in a **NOTE** is for guidance only.

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

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SECTION 1 – GENERAL

1.1 Submission of PPAP

The organization shall obtain approval (see 5.2.1) from the authorized customer representative for:

1. a new part or product (e.g., a specific part, material, or color not previously supplied to the specific customer).
2. correction of a discrepancy on a previously submitted part.
3. product modified by an engineering change to design records, specifications, or materials.
4. any situation required by Section 3.

NOTE: If there is any question concerning the need for production part approval, contact the authorized customer representative.

SECTION 2 – PPAP PROCESS REQUIREMENTS

2.1 Significant Production Run

For production parts, product for **PPAP** shall be taken from a significant production run. This significant production run shall be from one hour to eight hours of production, and with the specific production quantity to total a minimum of 300 **consecutive** parts, unless otherwise specified by the authorized customer representative.

This significant production run shall be conducted at the production site, at the production rate (see Glossary) using the production tooling, production gaging, production process, production materials, and production operators. Parts from each unique production process, e.g., duplicate assembly line and/or work cell, each position of a multiple cavity die, mold, tool or pattern, shall be measured and representative parts tested.

For bulk materials: No specific number of “parts” is required. The submitted sample shall be taken in a manner as to assure that it represents “steady-state” operation of the process.

NOTE: For bulk material, production histories of current products may often be used to estimate the initial process capability or performance of new and similar products. In cases where no production history of a similar bulk material product or technology exists, a containment plan may be put into effect until sufficient production has demonstrated capability or performance, unless otherwise specified by the customer.

2.2 PPAP Requirements

The organization shall meet all specified **PPAP** requirements listed below (2.2.1 through 2.2.18). The organization shall also meet all customer-specific **PPAP** requirements.

Production parts shall meet all customer engineering design record and specification requirements (including safety and regulatory requirements).

Bulk Material **PPAP** requirements are defined by a completed Bulk Material Requirements Checklist (see Appendix F).

If any part specifications cannot be met, the organization shall document their problem-solving efforts and shall contact the authorized customer representative for concurrence in determination of appropriate corrective action.

NOTE: Items or records from 2.2.1 through 2.2.18 may not necessarily apply to every customer part number from every organization. For example, some parts do not have appearance requirements, others do not have color requirements, and plastic parts may have polymeric part marking requirements. In order to determine with certainty which items must be included, consult the design record, e.g., part print, the relevant Engineering documents or specifications, and your authorized customer representative.

2.2.1 Design Record

The organization shall have the design record for the saleable product/part, including design records for components or details of the saleable product/part. Where the design record is in electronic format, e.g., CAD/CAM math data, the organization shall produce a hard copy (e.g., pictorial, geometric dimensioning & tolerancing [GD&T] sheets, drawing) to identify measurements taken.

NOTE 1: For any saleable product, part or component, there will only be one design record, regardless of who has design-responsibility. The design record may reference other documents making them part of the design record.

NOTE 2: A single design record can represent multiple part or assembly configurations, e.g., a sub-frame assembly with various hole configurations for different applications.

NOTE 3: For parts identified as black box (see Glossary), the design record specifies the interface and performance requirements.

NOTE 4: For parts identified as catalog parts, the design record may consist only of a functional specification or a reference to a recognized industry standard.

NOTE 5: For bulk materials, the design record may include identification of raw materials, formulations, processing steps and parameters, and final product specifications or acceptance criteria. If dimensional results do not apply, then CAD/CAM requirements are also not applicable.

2.2.1.1 Reporting of Part Material Composition

The organization shall provide evidence that the Material/Substance Composition reporting that is required by the customer has been completed for the part and that the reported data complies with all customer-specific requirements.

NOTE: This materials reporting may be entered into the IMDS (International Materials Data System) or other customer-specified system/method. IMDS is available through <http://www.mdsystem.com/index.jsp>.

2.2.1.2 Marking of Polymeric Parts

Where applicable, the organization shall identify polymeric parts with the ISO symbols such as specified in ISO 11469, "Plastics – Generic Identification and marking of plastic products" and/or ISO 1629, "Rubber and lattices – Nomenclature." The following weight criteria shall determine if the marking requirement is applicable:

- Plastic parts weighing at least 100g (using ISO 11469/1043-1)
- Elastomeric parts weighing at least 200g (using ISO 11469/1629)

NOTE: Nomenclature and abbreviation references to support the use of ISO 11469 are contained in ISO 1043-1 for basic polymers and in ISO 1043-2 for fillers and reinforcements.

2.2.2 Authorized Engineering Change documents

The organization shall have any authorized engineering change documents for those changes not yet recorded in the design record but incorporated in the product, part or tooling.

2.2.3 Customer Engineering Approval

Where specified by the customer, the organization shall have evidence of customer engineering approval.

NOTE: For bulk materials, this requirement is satisfied by a signed 'Engineering Approval' line item on the Bulk Material Requirements Checklist (see Appendix F) and/or inclusion on a customer maintained list of approved materials.

2.2.4 Design Failure Mode and Effects Analysis (Design FMEA) if the organization is product design-responsible

The product design-responsible organization shall develop a Design FMEA in accordance with, and compliant to, customer-specified requirements (e.g., **Potential Failure Mode and Effects Analysis** reference manual).

NOTE 1: A single Design FMEA may be applied to a family of similar parts or materials.

NOTE 2: For bulk materials, see Appendix F.

2.2.5 Process Flow Diagram(s)

The organization shall have a process flow diagram in an organization-specified format that clearly describes the production process steps and sequence, as appropriate, and meets the specified customer needs, requirements and expectations (e.g., **Advanced Product Quality Planning and Control Plan** reference manual). For bulk materials, an equivalent to a Process Flow Diagram is a Process Flow Description.

NOTE: Process flow diagrams for 'families' of similar parts are acceptable if the new parts have been reviewed for commonality by the organization.

2.2.6 Process Failure Mode and Effects Analysis (Process FMEA)

The organization shall develop a Process FMEA in accordance with, and compliant to, customer-specified requirements, (e.g., **Potential Failure Mode and Effects Analysis** reference manual).

NOTE 1: A single Process FMEA may be applied to a process manufacturing a family of similar parts or materials if reviewed for commonality by the organization.

NOTE 2: For bulk materials, see Appendix F.

2.2.7 Control Plan

The organization shall have a Control Plan that defines all methods used for process control and complies with customer-specified requirements (e.g., **Advanced Product Quality Planning and Control Plan** reference manual).

NOTE 1: Control Plans for "families" of parts are acceptable if the new parts have been reviewed for commonality by the organization.

NOTE 2: Control Plan approval may be required by certain customers.