WIRE WISDOM
Wire & Cable Group

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PPAPs for the Automotive Industry

The Purpose of PPAPs

PPAP is an acronym for "Production Part Approval Process" and is usually pronounced "pee-pap." In this edition of Wire Wisdom, you will find a summary regarding the purpose and requirements of PPAP quality related documentation. The primary purpose of the PPAP quality documentation system is to verify a manufacturer's ability to produce and to consistently provide an automotive part that fully complies with purchase order requirements.

The PPAP system is unique to the automotive industry. However, the large amount of documentation required in a PPAP submission is similar to the extensive documentation often required by the aviation and nuclear industries. Wire and cable products typically require about 40 pages of PPAP documentation for each part number. The large amount of documentation is necessary to reduce the likelihood of an automotive part failure, which can reduce vehicle safety, vehicle reliability and customer satisfaction as well as interrupt new vehicle production.

PPAPs are required for most parts used in vehicle construction. In the automotive wire and cable industry, PPAPs are typically required for SAE battery cable[1] types such as SGT and SGX as well as SAE primary cable[2] types such as SXL, GXL, TXL, GPT and TWP.

Submission Levels

PPAP documentation must comply with one of five Submission Levels as defined in the PPAP manual.[3] These levels are summarized in Table 1. The part purchaser can specify any submission level, but

Table 1 -- PPAP Submission Levels

Level 1 -	Part Submission Warrant (PSW) only.
Level 2 -	PSW with product samples and limited supporting data.
Level 3 -	PSW with product samples and complete supporting data.
Level 4 -	PSW and other requirements as defined by the customer.
Level 5 -	PSW with product samples and complete supporting data available for review at the manufacturing location.

[1] SAE J1127, Low Voltage Battery Cable, Society of Automotive Engineers, www.sae.org
[2] SAE J1128, Low Voltage Primary Cable, Society of Automotive Engineers, www.sae.org
[3] PPAP-4, Production Part Approval Process, 4th edition, Automotive Industry Action Group, www.aiag.org

(continued)

Level 3 is the most common in the wire and cable industry.

The PPAP Manual

PPAP procedures and requirements are spelled out in detail in a 65-page manual first published in 1993. It was the result of a joint effort of Chrysler (now DaimlerChrysler), Ford and General Motors working under the auspices of the American Society for Quality Control (ASQ)[4] and the Automotive Industry Action Group (AIAG)[5]. Their purpose was to "standardize the reference manuals, procedures, reporting formats, and technical nomenclature" used in their respective supplier quality systems. The fourth edition of the manual was recently published and went into effect June 1, 2006. It spells out in detail the information required in a PPAP submission. It also contains a glossary of PPAP related terms and the forms required to prepare and submit PPAP documentation. Copies of the manual are available from AIAG.

Information Required in a PPAP Submission

For a standard "Level 3" submission, the PPAP process requires the manufacturer to address each of the topics shown in Table 2. Details of what must be included in each topic are contained in the PPAP manual. As you can see, the documentation required is comprehensive. The good news is that experienced automotive wire and cable manufacturers are well practiced in preparing and submitting PPAPs.

Table 2 -- PPAP Requirements for a Level 3 Submission

- Design records
- Engineering changes
- Engineering approvals
- Design Failure Mode and Effects Analysis (FMEA)
- Process flow diagrams
- Process failure mode and effects analysis
- Control plan
- Measurement system analysis studies
- Dimensional results
- Material, performance test results
- Initial process studies
- Qualified laboratory documentation
- Appearance Approval Report (if applicable)
- Sample product
- Records of compliance with customer-specific requirements
- Part Submission Warrant (PSW)

PPAP submissions are generally valid until a design or process change is made to a part by the manufacturer—or until the item has been out of production for 12 months or more. If a change to a part is being contemplated, manufacturers and distributors are required to notify their customers prior to implementing the change. In this case, the manufacturer will most likely be required to submit updated PPAP documentation.WDW

[4] www.asq.org
[5] www.aiag.org