# APQP ELEMENT EXPECTATIONS

The following section describes Stackpole expectations for each of the APQP elements found on the Advanced Product Quality Planning (APQP) Matrix.

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| **1.** | **Design Failure Mode and Effects Analysis** | • Suppliers with Design Responsibility must create product specific DFMEA<br>• Others should request Stackpole. DFMEA & evaluate their products.<br>• Evaluation should include failure mode analysis, input to design controls, agreement with action plans & timing.<br>• Review & Acceptance should be documented utilizing AIAG DFMEA Checklist (or equivalent). |
| **2.** | **Design Reviews** | • Suppliers must provide evidence of design review being conducted with Stackpole Launch Team personnel<br>• Design Issues must be documented in some form of issues list tracking ownership & completion.<br>• Review & Acceptance of design should be documented utilizing AIAG A-2 Checklist (or equivalent). |
| **3.** | **Design Verification Plan** | • Evidence of agreement/approval from Stackpole must be provided for:<br>– Performance Validation Plan<br>– Functional Validation Plan<br>– Dimensional Validation Plan<br>– Consideration of Measurement System Analysis for prototype and production<br>– Stackpole approval |
| **4.** | **Master Timing Plan** | • Master Timing Plan Minimum Requirements:<br>– Prototype Build Dates, Quantities, & Material Required Date at Stackpole (MRD)<br>– Pre-Production Build Dates, Quantities, & MRD<br>– Production SOP Build Dates, Quantities, & MRD<br>– Tool Timing<br>– Equipment Timing<br>– Dimensional Validation<br>– Functional Validation<br>– Performance Validation<br>– Associate Training<br>– Sub-Supplier PPAP Timing<br>– PPAP Submission detailing Key Milestones such as Appearance Approval, etc. |
| **5.** | **Facilities, Tools, and Gauges** | • Self-explanatory on matrix<br>• Refer to AIAG APQP Manual Checklists |
| **6.** | **Prototype Build Control Plan** | • Includes Hand Assembly Operations<br>• Product Fit/Function Validation<br>• Product Layout<br>• See AIAG APQP Manual Appendix A Checklist |
| **7.** | **Prototype/Mule Builds** | • All Stackpole prototype material required dates (MRD) will be met with the correct level parts, customer specified data, and Stackpole approval for any nonconformance. |
| **8.** | **Design Verification Testing** | • Design testing completed per DVP&R (item 3).<br>• All design deficiencies identified are updated in DFMEA, corrected, and retested. |

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| **9.** | **Prototype Part Layout and SSC/SCC Ppk** | • Include preliminary critical characteristic designation.<br>• Include surrogate capability data for tolerance.<br>• Product Fit/Function Validation prior to shipment.<br>• Product Layout to occur prior to shipment.<br>• Advanced notification & agreement of product not meeting specification prior to shipment. |
| **10.** | **Drawings and Specifications** | • Suppliers will work with Stackpole to ensure engineering specification tests, and product validation test requirements are documented in time to support pre-launch control plan development.<br>• Suppliers will coordinate with Stackpole the need to use Stackpole's customer approved source lists. |
| **11.** | **Team Feasibility Commitment** | • Team Feasibility Commitment has been reviewed by team and signed off as approved to current design level for all Milestone Reviews |
| **12.** | **Manufacturing Process Flow Chart** | • Process Flow Chart used to develop PFMEA and Control Plan.<br>• AIAG checklist A-5 or equivalent initiated and open issues identified with actions<br>• Launch containment is addressed in flow. |
| **13.** | **Process Failure Mode and Effects Analysis** | • PFMEA is Process Failure Driven, not Product Failure Driven.<br>• PFMEA approved by Stackpole.<br>• AIAG checklist A-7 or equivalent utilized in conjunction with AIAG FMEA manual<br>• Packaging, labeling and shipping are included in analysis. |
| **14.** | **Measurement Systems Evaluation** | • Stackpole must be given the opportunity to review and concur with the gauge and test equipment plans and actual study results<br>• Utilization of AIAG Measurement Systems Analysis Reference Manual for guidance on utilizing statistical techniques to develop and qualify measurement systems. |
| **15.** | **Pre-Launch Control Plan** | • Pre-launch control plan approved by Stackpole (also referred to as pre-production control plan)<br>• Launch containment is documented in plan<br>• AIAG checklist A-8 or equivalent is utilized |
| **16.** | **Production Ramp-up Schedule** | • The supplier will define their own Ramp up schedule to support the Stackpole Production Ramp-up Schedule.<br>• Supplier understands Stackpole Material Release Process and has systems in place prior to SOP. |
| **17.** | **Packaging Specifications** | • Packaging requirements will be agreed to by the supplier and the Stackpole Division<br>– Includes prototype packaging.<br>• Production packaging approved via Stackpole Packaging Declaration form |
| **18.** | **Production Control Plan** | • Production control plan approved by Stackpole.<br>• Launch containment is documented in plan if required<br>• AIAG checklist A-8 or equivalent is utilized<br>• Supplier has audited implementation of control plan in production environment |
| **19.** | **Production Trial Run** | • PPAP run complete with production process, tooling and equipment.<br>• Problems identified are quickly addressed with corrective actions<br>• Scrap rate and cycle time 100% to plan. |
| **20.** | **Production Part Layout** | • Part layout requirements agreed with Stackpole in advance - number of pieces, dimensions, etc.<br>• Dimensional results approved by Stackpole<br>• Out of Tolerance Items - actions to correct items should be complete prior to PPAP |

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| **21.** | **Launch Readiness Review Meeting** | • Launch readiness reviews are conducted with Stackpole to review status of program and evidence to support ratings in APQP matrix. Run-at-Rate acceptable prior to SOP. |
| **22.** | **Preliminary Process Capability Study** | • PpK studies complete and meet PPAP requirements. Containment plans are in place and documented on the control plan for unstable processes or PpK < 1.67 |
| **23.** | **Production Validation Testing** | • All dimensional, material, functional, and reliability tests must be completed prior to production part approval. If not, appropriate action plans and Stackpole approvals are required. |
| **24.** | **Boundary Samples** | • The Boundary Samples will be signed off by Stackpole |
| **25.** | **Production Part Approval** | • All items of the AIAG *Production Part Approval Process* manual must be completed and the required documentation provided to Stackpole with the Part Submission Warrant.<br>• All Results Must be ballooned to drawing, whether assembly or sub-component<br>• Type of device utilized to obtain data needs to be identified<br>• Provide evidence of service provider certification for layout and lab if external site used<br>• Include copy of Specifications in PPAP submission<br>• Include evidence of sub-supplier PPAP approvals<br>• Additional information may be required that Stackpole Facility specific. Contact your Stackpole Divisional Quality Department in advance for additional requirements |
| **26.** | **Production Part Delivery at MRD** | • Production shipping schedules established to support Stackpole requirements<br>• Delivery and frequency method agreement made with Stackpole. |
| **27** | **IMDS Data Entered into System** | • Suppliers are required to sign in to the IMDS system and log the information for the part. See section 2.9 of this manual for more information on IMDS. |