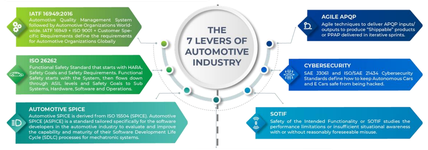
Automotive Core Tools

APQP Process

Fundamentals of Product Quality Planning	Plan and Define Program	Product Design and Development	Process Design and Development	Product and Process Validation	Feedback, Assessment and Corrective Action
a. Organize the Team b. Define the Scope c. Establish Team-to-Team communication d. Provide Core Tool Training e. Customer and Supplier Involvement f. Implement Simultaneous Engineering g. Implement Simultaneous Engineering h. Development Control Plan Format i. Decide on Concern Resolution j. Develop Product Quality Timing Plan k. Adjust Plans Relative to Customer Timing	**Input** 1.1 Voice of the Customer 1.1.1 Market Research 1.1.2 Historical Warrenty and Quality Information 1.2 Business Plan and Marketing Strategy 1.3 Procuct / Process Benchmark Data 1.4 Procuct / Process Assumptions 1.5 Product Reliability Studies 1.6 Customer Inputs **Output** 1.7 Design Goals 1.8 Reliability and Quality Goals 1.9 Preliminary Bill of Material [BOM] 1.10 Preliminary Process Flow Chart 1.11 Preliminary Identification of Special Product and Process Characteristics 1.12 Product Assurance Plan 1.13 Management Support Input for the next Phase	**Design Outputs** 2.1 Design Failure Mode and Effects Analysis [DFMEA] 2.2 Design for Manufacturability and Assembly 2.3 Design Verification (DVP&R) 2.4 Design Reviews 2.5 Prototype Build – Control Plan 2.6 Engineering Drawings [include Math Data] 2.7 Engineering Specifications 2.8 Material Specifications 2.9 Drawing and Specifcation Changes Input for the next Phase **APQP Outputs** 2.10 New Equipment, Tooling and Facilities Requirements 2.11 Special Product and Process Characteristics 2.12 Gages / Testing Equipment & Management Support Input for the next Phase	**Output** 3.1 Packaing Standards and Specifications 3.2 Product / Process Quality System Review 3.3 Process Flow Chart 3.4 Floor Plan Layout 3.5 Characteristics Matrix 3.6 Process Failure Mode and Effects Analyisi [PFMEA] 3.7 Pre-Launch Control Plan 3.8 Process Instructions 3.9 Measurement Systems Analysis Plan 3.10 Preliminary Process Capability Study Plan 3.11 Management Support Input for the next Phase	**Output** 4.1 Significant Production Run 4.2 Measurement Systems Evaluation 4.3 Preliminary Process Capability Study 4.4 Production Part Approval 4.5 Production Validation Testing 4.6 Packaging Evaluation 4.7 Production Control Plan 4.8 Quality Planning Sign-Off and Management Support Input for the next Phase	**Output** 5.1 Reduce Variation 5.2 Improved Customer Satisfaction 5.3 Improved Delivery and Service 5.4 Effective Use of Lessons Learned

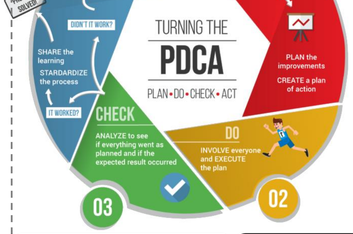
Advanced product quality planning
is a system for designing and delivering quality products and eliminating the risk of product failure.



Product Quality Planning Timing Chart

Planning
Product Design and Development
Process Design and Development
Product and Process Validation
Production
Feedback Assessment and Corrective Action

Definitionsphase	Prototypenphase	Optimierungsphase / Pilotphase	Serienvorbereitungsphase / Vorserie	Hochlaufphase
2. Customer Input Requirements 3. Craftmanship 5. Design / Manufacturing Reviews 12. Team Feasibility Commitment	1. Sourcing Decision 13. Manufacturing Process Flow Chart 11. Drawings and Specifications 4. Design Failure Mode and Effects Analysis (DFMEA 6. Design Verification and Report (DVP&R) 9. Prototyp Build Control Plan 10. Prototyp Builds 16. Pre Launch Control Plan 8. Facilities, Tools & Gauges 14. Process Failure Mode and Effects Analysis (PFMEA) / System-FMEA 20. Production Control Plan 17. Operator Process Instruction 18. Packaging Specifications 15. Measurement Systems Evaluation 7. Subcontractor APQP Status 19. Production Trial Run 21. Preliminary Process Capability 23. Part Submission Warrent (PSW) 22. Production Validation Testing			**APQP** Advanced Product Quality Planning PHASE 1 Plan and Define Program PHASE 2 Product Design and Development Verification PHASE 3 Process Design and Development Verification PHASE 4 Product and Process Validation and Production Feedback PHASE 5 Launch, Assessment and Corrective Action 8 Wochen vor der Erstbemusterung



APQP Status Reporting (Customer-side)

Checkliste Qualitätsvorausplanung

Planungsphase	Produktentwicklungsphase	Prozessentwicklungsphase	Produkt- und Prozessvalidierungsphase	Serienanlaufphase
1. Auftrag vom Kunden vorhanden 2. Lastenheft liegt vor und durchgearbeitet 3. Machbarkeitsanalyse durchgeführt 4. Pflichtenheft erstellt 5. QSV zwischen Kunden und Supplier liegt vor 6. Zusammenstellung APQP-Team 7. Projektplan ausgearbeitet und eingeführt	1. Design DFMEA erstellen 2. Design überprüft, überarbeitet und mit Kunden abgestimmt 3. Fertigungsgerechte- und Montagegerechte Designauslegung beachtet 4. Technische Zeichnung und Materialspezifikation vorhanden 5. Besondere Produktmerkmale / Prozessmerkmale bestimmt 6. Herstellbarkeitsbewertung durchgeführt 7. Stückliste auf Zeichnungsbasis erstellt 8. Prototyp QM-Plan aufgestellt 9. Prototyp gefertigt bzw. vorhanden und bewertet	1. MSA erstellen 2. Verpackungsnormen und Richtlinien des Kunden eingehalten und umgesetzt 3. Layout und Prozessflussdiagramm erarbeitet + Freigabe durch Kunden 4. Prozess FMEA erstellt 5. MFU –SPC- durchgeführt	1. PPAP / PPF-Unterlagen vollständig 2. Serien QM-Plan aufgestellt 3. 8D-Report eingeführt 4. System-FMEA 5. Vorläufige PFU –SPC- 6. Schulung der Mitarbeiter –speziell zum Thema Qualität-	1. Safe Launch eingeführt 2. Run@Rate eingeführt 3. Langzeit PFU –SPC- 4. Produktaudit durchgeführt 5. Projektordner angelegt 6. Lessons Learned analysiert

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