



APQP 4 Wind®

APQP4Wind Manual

APQP4Wind 手册

Advanced Product Quality Planning Manual for the Wind Industry

风电行业产品质量先期策划手册

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APQP4Wind

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Introduction to APQP4Wind

At the beginning of 2014, Wind Denmark (formerly known as the Danish Wind Industry Association) started a network group consisting of Suppliers with an interest in quality assurance. To strengthen the network, wind turbine manufacturers and utility companies were invited to participate on equal footing with the Suppliers.

In February 2014, the first meeting in Wind Denmark's Quality Assurance (QA) network took place. This marked the very beginning of quality assurance cooperation between wind turbine manufacturers, utility companies and Suppliers within the Danish wind industry, and subsequently the idea of APQP4Wind was born.

With facilitation from Wind Denmark and support from the Danish Industry Foundation, Siemens Gamesa Renewable Energy and Vestas Wind Systems shared leadership of the APQP4Wind project running from 2015 to 2018 in cooperation with KK Wind Solutions and LM Wind Power.

In August 2018, APQP4Wind was established as an independent organization with global reach and a board of directors representing GE Renewable Energy, KK Wind Solutions, LM Wind Power, Siemens Gamesa Renewable Energy, Vestas Wind Systems, and Wind Denmark.

The purpose of APQP4Wind

APQP4Wind is a common quality assurance methodology for the global wind industry. The background for the APQP4Wind Manual is the continuous quality improvement that is needed to reduce risk, lower the costs of poor quality, and keep pace with the ongoing trend towards decreases in the Levelized Cost of Energy within the wind industry.

Advanced Product Quality Planning (APQP) is a well-known concept within the automotive industry and has been the backbone for maturing quality performance at Customers and Suppliers for decades. In the context of APQP4Wind, the concept of APQP in this Manual is adapted to the business areas and special conditions differentiating wind from automotive.

The APQP4Wind Manual aims to make the process of product quality assurance demands as well as Production Part Approval Process (PPAP) as clear as possible. The Manual is made to fit the entire wind industry and set a common standard and best practice for how to plan and execute quality assurance in the entire supply chain, from manufacturers to Suppliers of components.

The standards made available in this Manual are made to substitute company-specific procedures and set aligned methods and procedures for all Suppliers and Sub-Suppliers to reduce time to market and increase efficiency within the global wind industry.

The APQP4Wind Manual has been subjected to multiple reviews involving subject matter experts from the APQP4Wind Working Group, Board of Directors, members of Wind Denmark's QA network and a certifying body.

All future activities, documents and references can be found at:

www.apqp4wind.org

The APQP4Wind Manual will refer several times to the Toolbox consisting of a Workbook and Analysis Tool:

www.apqp4wind.org/manual-and-toolbox

APQP4Wind简介

2014年初, Wind Denmark(丹麦风能公司, 前身为丹麦风电工业协会)成立了一家由供应商组成的工作组, 致力于实施产品质量保证。为提升工作组的实力, 丹麦风能公司邀请风力发电机制造商与公用事业公司以与供应商平等的身份加入工作组。

2014年2月, 丹麦风能公司质量保证(QA)网络举行首届会议。这届会议标志着丹麦风电行业的风电机组制造商、公用事业公司与供应商之间的质量保证合作的开端, APQP4Wind的理念也随之诞生。

在丹麦风能公司和丹麦工业基金会的大力支持下, 西门子歌美飒再生能源公司(Siemens Gamesa Renewable Energy)、维斯塔斯风力技术集团(Vestas Wind Systems)与KK风能解决方案公司(KK Wind Solutions)和LM风电公司(LM Wind Power)合作, 于2015至2018年间共同领导APQP4Wind项目。

2018年8月, APQP4Wind作为一家具有全球影响力的独立组织正式成立, 其董事会由GE可再生能源公司、KK风能解决方案公司、LM风能公司、西门子歌美飒再生能源公司、维斯塔斯风力技术集团和丹麦风能公司的代表组成。

APQP4Wind目的

APQP4Wind是全球风电行业的通用质量保证方法。为减少风险、降低劣质产品造成的成本、紧随风电行业“平准化度电成本”不断下降的趋势, 风电行业亟须持续改进质量, 《APQP4Wind手册》正是在这种背景下应运而生。

产品质量先期策划(APQP)是汽车行业广为人知的理念, 几十年来始终是客户与供应商改进质量绩效的基石。在APQP4Wind的背景下, 本手册根据风能业务领域的具体情况和特殊条件对APQP概念进行了改进, 以区分风能行业与汽车行业的差异。

APQP4Wind手册旨在使产品质量保证需求流程和生产件批准程序(PPQP)尽可能地清晰化。本手册适用于整个风电行业, 制定了通用标准和最佳实践, 用于在从制造商到组件供应商的整个供应链内计划和执行质量保证工作。

本手册所制定的标准能够替代公司的具体程序, 为所有供应商和次级供应商制定统一的方法与过程, 以缩短产品上市周期, 提高全球风电行业的效率。

《APQP4Wind手册》已接受多次评审, 评审者包括来自APQP4Wind工作组、董事会、丹麦质量保证组织的成员以及认证机构的主题事务专家。

您可以通过以下网站了解未来活动以及相关文件与参考资料:

www.apqp4wind.org

《APQP4Wind手册》多次提及包括“工作手册”和“分析工具”在内的“工具箱”, 具体请参见:

www.apqp4wind.org/Manual-and-toolbox

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Partial Preview

Introduction

The purpose of this document is to communicate to Suppliers and Sub-Suppliers a common Advanced Product Quality Planning (APQP) Manual developed by the APQP4Wind Organization. The Manual provides the information and requirements to develop a product quality plan that should enable development and production of product or service that will fulfill wind turbine manufacturers' requirements.

The main objective of the approach outlined in this Manual is to:

- Reduce the risk of defects and the costs of quality when introducing new designs and components, thereby bringing down the costs of energy.
- Reduce complexity.
- Improve alignment of Product Quality Planning (PQP) in the wind industry value chain.
- Provide an effective medium to easily communicate product quality requirements to Suppliers and Sub-Suppliers.
- Avoid problem/failure repetition.

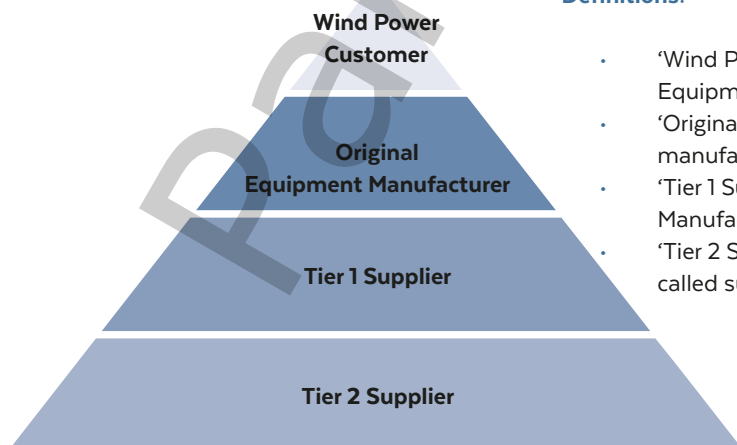
The key benefits for the wind industry of using the approach described in this Manual are:

- Preventive approach to quality.
- Shift from quality control to quality assurance.
- Enabling the Supplier base to mature globally.
- Support standardization and simplification of processes to reduce time to market and increase efficiency.
- Support profitable growth.

The purpose of this Manual is to provide guidance to Suppliers on the quality requirements and enable organizations to develop appropriate communication forms. This Manual supports the quality requirements in the wind power industry by providing recommended formats and templates such as the Product Quality Plan (PQP). The Supplier shall comply with Customer-specific quality requirements specified in addition to this Manual. Environmental, Health and Safety (EHS) requirements are not in scope of this Manual, however, the Supplier shall comply with the legal or Customer-specific requirements with respect to EHS.

The term 'product' used throughout this Manual should be interpreted as the system, subsystem, component or service provided.

Supply Chain Pyramid



Definitions:

- 'Wind Power Customer': Client and/or End-User of Original Equipment Manufacturer's product.
- 'Original Equipment Manufacturer': Wind turbine manufacturer also called 'OEM'.
- 'Tier 1 Supplier': Direct Suppliers to the Original Equipment Manufacturer.
- 'Tier 2 Supplier': Supplier to Tier 1 Suppliers. Suppliers also called sub-tier Supplier to 'OEM'.

The above illustration depicts the supply chain structure applicable to this Manual.

简介

本文旨在向供应商与次级供应商介绍由APQP4Wind组织开发的通用型《产品质量先期策划(APQP)手册》。该手册提供了制定产品质量策划所需要的信息和条件, 此类计划能够为产品或服务的开发和生产提供帮助, 满足风电机组制造商的要求。

本手册介绍的方法主要用于:

- 引入新设计和组件时降低缺陷风险和质量成本, 进而降低能源成本。
- 降低复杂性。
- 在风电产业价值链中增强产品质量策划(PQP)的统一性。
- 提供有效媒介, 便于向供应商和次级供应商传达产品质量要求。
- 避免反复出现同样的问题/失效。

本手册所述方法为风电行业带来的主要好处包括:

- 提供质量预防方法。
- 从质量控制转向质量保证。
- 促进全球供应商基础发展成熟。
- 对过程进行标准化与简化, 缩短产品上市周期, 提高工作效率。
- 促进利润增长。

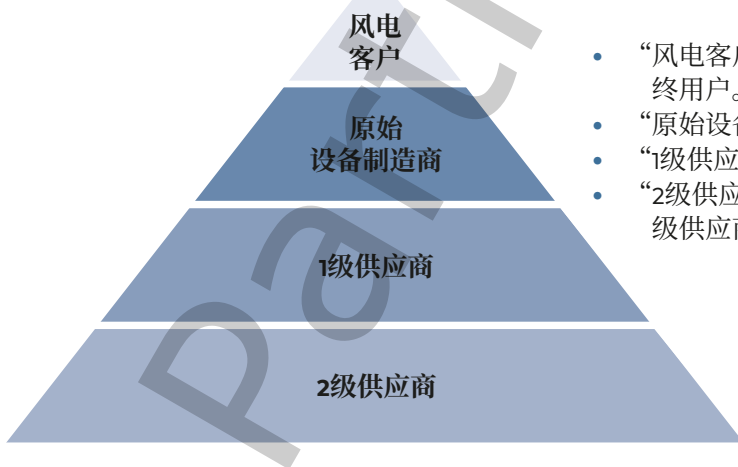
本手册旨在向供应商提供质量要求方面的指导, 帮助企业组织制定行之有效的沟通方式。本文提供产品质量策划(PQP)等推荐的格式和模板, 以支持企业满足风电行业的质量要求。除本手册外, 供应商还应遵守其他具体客户质量要求。

环境、健康和安全(EHS)要求不在本手册的规定范畴, 但供应商应遵守所有与EHS相关的法律或具体客户要求。

本手册所用术语“产品”系指所提供的系统、子系统、组件或服务。

供应链金字塔

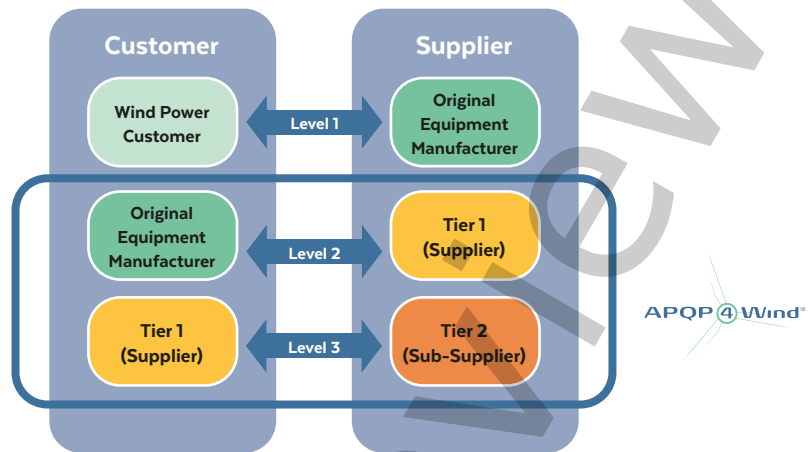
定义:



- “风电客户”: 原始设备制造商产品的客户和/或最终用户。
- “原始设备制造商”: 风力发电机制造商也称“OEM”。
- “1级供应商”: 原始设备制造商的直接供应商。
- “2级供应商”: 1级供应商的供应商。也称“OEM”的次级供应商。

上图描述了本手册适用的供应链结构。

The scope of this Manual with respect to the Supply Chain Pyramid is further clarified by the Customer-Supplier relationship model below. The Customer-Supplier levels may extend beyond Level 3. The requirements in this Manual shall be applicable to all levels except Level 1 of the model. Hereafter, the words 'Customer' and 'Supplier' are used based on the below model.

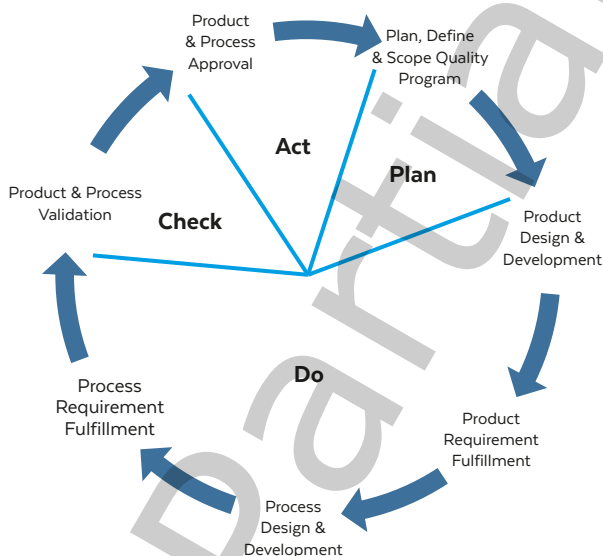


Product Quality Planning Cycle

The Product Quality Planning Cycle is shown below as a graphical illustration of the APQP4Wind Quality Program. The various phases are sequenced to represent planned timing and follow a typical Plan-Do-Check-Act (PDCA) cycle.

The purpose of the Product Quality Planning Cycle is:

- To set a clear path for planning, implementing and verifying the product conformance to requirements through quality assurance activities.
- To enable Suppliers and Sub-Suppliers to deliver the right products with the required quality and quantity the first time and on time.



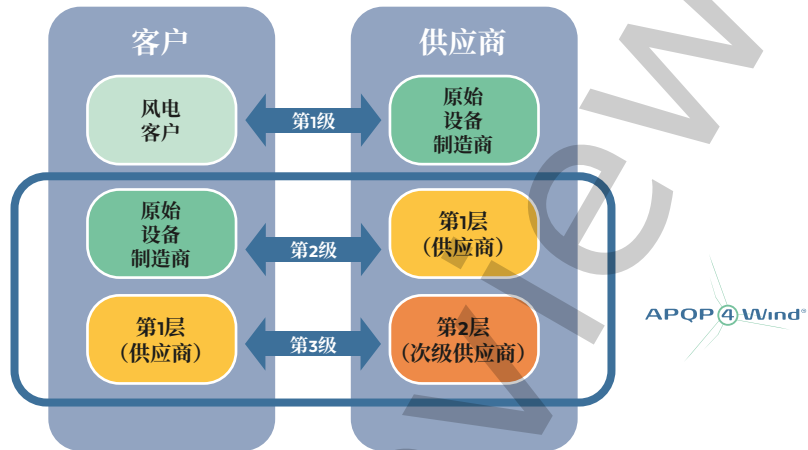
The Product Quality Planning Cycle emphasizes a cross-functional approach between the Customer and Supplier, thereby improving communication and collaboration in the entire product quality cycle.

Reference:
Workbook
Sheet: Product
Quality Plan

As an outcome of product quality planning, the Supplier shall have a Product Quality Plan which contains a list of quality deliverables that are outcomes of various quality assurance activities that the Supplier executes.

The level of activities in the Product Quality Plan may vary, based on the product being developed.

下面的“客户-供应商关系模型”进一步阐释了本手册有关供应链金字塔的内容。“客户-供应商”层级可能超出第3层级。本手册提出的要求应适用于除模型第1层级以外的所有层级。下文使用的“客户”和“供应商”两词均以下面的模型为基础。

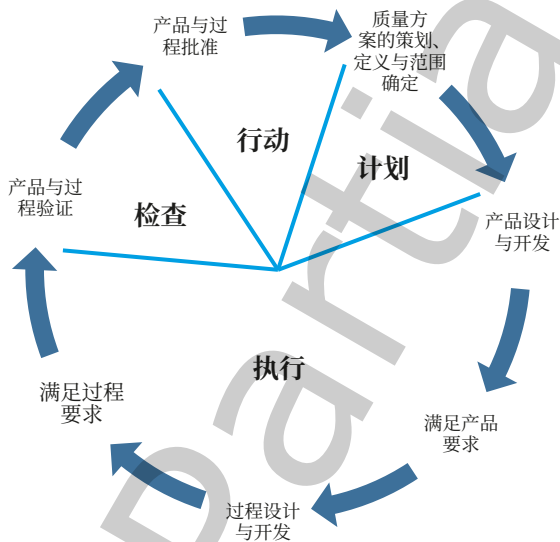


产品质量策划周期

产品质量策划周期如以下APQP4Wind质量方案图解所示。各阶段按顺序排列，表示计划的时间安排，遵循典型的“计划-执行-检查-行动”(PDCA)周期。

产品质量策划周期旨在：

- 通过实施质量保证活动确定一条清晰的计划、实施和验证路径，确保产品符合质量要求。
- 帮助供应商和次级供应商在第一时间、准时、按质、按量交付产品。



“产品质量策划周期”强调采用客户与供应商跨职能方法，改进整个产品质量周期的沟通和协作。

参考资料：
工作手册
表：产品质量
策划

作为产品质量策划成果，供应商应制定一份《产品质量策划》，包含一份可交付质量成果清单，列出供应商实施的各类质量保证活动的成果。

根据所开发产品的不同，《产品质量策划》中的活动级别也可能有所不同。

Responsibility Matrix

Supplier Nature

APQP4Wind Phases	APQP Chapter	APQP4Wind Element	Design-Responsible Supplier	Manufacture to Spec./Mat. Supplier
1.0 Plan, Define & Scope Quality Program	1.1	Voice of Customer	x	x
	1.2	Design Goals	x	
	1.3	Product & Process Benchmark Data	x	x
	1.4	Product & Process Assumptions	x	x
	1.5	Historical Data & Quality Information	x	x
	1.6	Sub-Supplier Screening	x	x
	1.7	APQP Kickoff	x	x
	1.8	Product Quality Planning Team	x	x
	1.9	Product Quality Plan (PQP)	x	x
2.0 Product Design & Development	2.1	Engineering Design Review (EDR)	x	
	2.2	Drawing & Specification Review	x	x
	2.3	Team Feasibility Commitment (TFC)	x	x
	2.4	DFMEA (Design Failure Mode & Effects Analysis)	x	
	2.5	Special Characteristics	x	x
	2.6	Design for Manufacturability, Assembly, Transport & Service	x	
	2.7	Design Verification Plan (DVP)	x	
	2.8	New Equipment, Tooling, Gauge/Test & Facilities Requirement	x	x
	2.9	Preliminary BOM & BOM Management	x	x
	2.10	Sub-Supplier Assessments	x	x
	2.11	Engineering Change Management (ECM)	x	x
3.0 Product Requirement Fulfillment	3.1	Design Verification Report (DVR)	x	
	3.2	Tool Design & Approval	x	x
	3.3	Sub-Supplier Product Quality Plan	x	x
	3.4	Customer Engineering Approval	x	x
	3.5	Prototype Control Plan	x	x
	3.6	Prototype Builds	x	x
4.0 Process Design & Development	4.1	Preliminary Process Flow Chart & Floor Plan	x	x
	4.2	PFMEA (Process Failure Mode & Effects Analysis)	x	x
	4.3	MSA Plan (Measurement System Analysis)	x	x
	4.4	Preliminary Process Capability Study Plan	x	x
	4.5	Packaging & Transport Specifications	x	x
5.0 Process Requirement Fulfillment	5.1	Process Flow Chart & Floor Plan	x	x
	5.2	Production Tool Builds	x	x
	5.3	0-Series Control Plan	x	x
	5.4	Work Instructions	x	x
	5.5	Preliminary Process Capability Study	x	x
	5.6	Sub-Supplier PPAP Completion	x	x
6.0 Product & Process Validation	6.1	0-Series Production	x	x
	6.2	Performance Test Report & Certification	x	x
	6.3	Material Test Report & Certification	x	x
	6.4	Dimensional Report	x	x
	6.5	Appearance Approval Report	x	x
	6.6	MSA Report (Measurement System Analysis)	x	x
	6.7	Product Validation Testing	x	
	6.8	Form, Fit & Function (FFF)	x	x
	6.9	Serial Production Control Plan	x	x
	6.10	Packaging & Transport Evaluation	x	x
7.0 Product & Process Approval	7.1	PPAP Documentation (Production Part Approval Process)	x	x
	7.2	Master Samples	x	x
	7.3	PPAP Submission & PSW (Part Submission Warrant)	x	x

Design-Responsible Supplier:

Suppliers who own the design of the product, e.g., gearbox Supplier.

Manufacture to Specification/Material Processing Supplier:

Suppliers who do not own the design of the product, but manufacture based on drawing, specifications and requirements by the Customer. This category also includes Suppliers who perform specific processes, e.g., heat treatment, surface treatment, etc., on Customers' material based on the requirements provided by Customer.

责任矩阵

供应性质

APQP4Wind 阶段	APQP 章节	APQP4Wind 要素	负责设计的供应商	按照规范进行制造的供应商
1.0 质量方案的策划、定义与范围确定	1.1	客户呼声	x	x
	1.2	设计目标	x	
	1.3	产品与过程基准数据	x	x
	1.4	产品与过程假设	x	x
	1.5	历史数据与质量信息	x	x
	1.6	次级供应商筛选	x	x
	1.7	APQP启动	x	x
	1.8	产品质量策划小组	x	x
	1.9	产品质量策划(PQP)	x	x
2.0 产品设计与开发	2.1	工程设计评审(EDR)	x	
	2.2	图样与规范评审	x	x
	2.3	小组可行性承诺(TFC)	x	x
	2.4	设计失效模式和效果分析(DFMEA)	x	
	2.5	特殊特性	x	x
	2.6	可制造性、装配、运输和服务设计	x	
	2.7	设计验证计划(DVP)	x	
	2.8	新设备、工具、量具/测试和设施要求	x	x
	2.9	初始材料清单(BOM)与材料清单管理	x	x
	2.10	次级供应商评估	x	x
	2.11	工程变更管理(ECM)	x	x
3.0 满足产品要求	3.1	设计验证报告(DVR)	x	
	3.2	工装设计与批准	x	x
	3.3	次级供应商产品质量策划	x	x
	3.4	客户工程批准	x	x
	3.5	样件控制计划	x	x
	3.6	样件制造	x	x
4.0 过程设计与开发	4.1	初始工艺流程图与平面布置图	x	x
	4.2	过程失效模式和效果分析(PFMEA)	x	x
	4.3	测量系统分析(MSA)计划	x	x
	4.4	初始过程能力研究计划	x	x
	4.5	包装与运输规范	x	x
5.0 满足过程要求	5.1	工艺流程图与平面布置图	x	x
	5.2	制造生产工具	x	x
	5.3	0批量生产控制计划	x	x
	5.4	作业指导书	x	x
	5.5	初始过程能力研究	x	x
	5.6	次级供应商完成PPAP	x	x
6.0 产品与过程验证	6.1	0批量生产	x	x
	6.2	性能测试报告与认证	x	x
	6.3	材料测试报告与认证	x	x
	6.4	尺寸报告	x	x
	6.5	外观批准报告	x	x
	6.6	测量系统分析(MSA)报告	x	x
	6.7	产品验证测试	x	
	6.8	形式、装配及功能(FFF)	x	x
	6.9	批量生产控制计划	x	x
	6.10	包装与运输评估	x	x
7.0 产品与过程批准	7.1	生产件批准程序(PPAP)文档	x	x
	7.2	标准样品	x	x
	7.3	PPAP提交与部件提交保证(PSW)	x	x

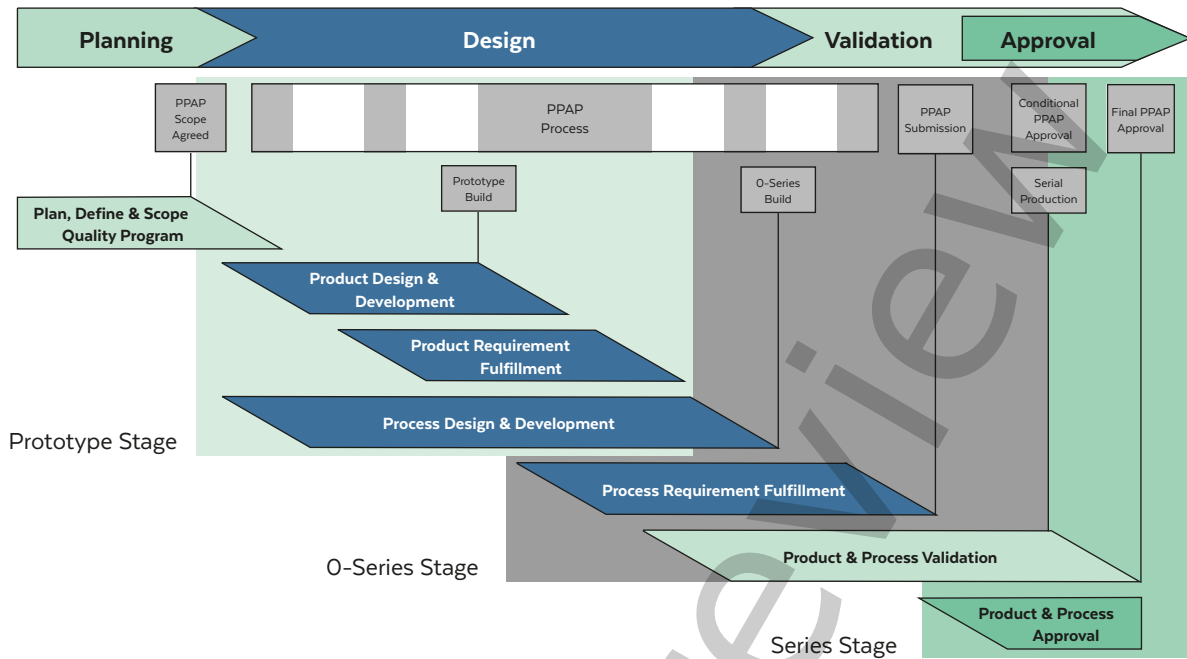
负责设计的供应商:

负责产品设计的供应商,如变速箱供应商。

根据规范制造产品的供应商/材料加工供应商:

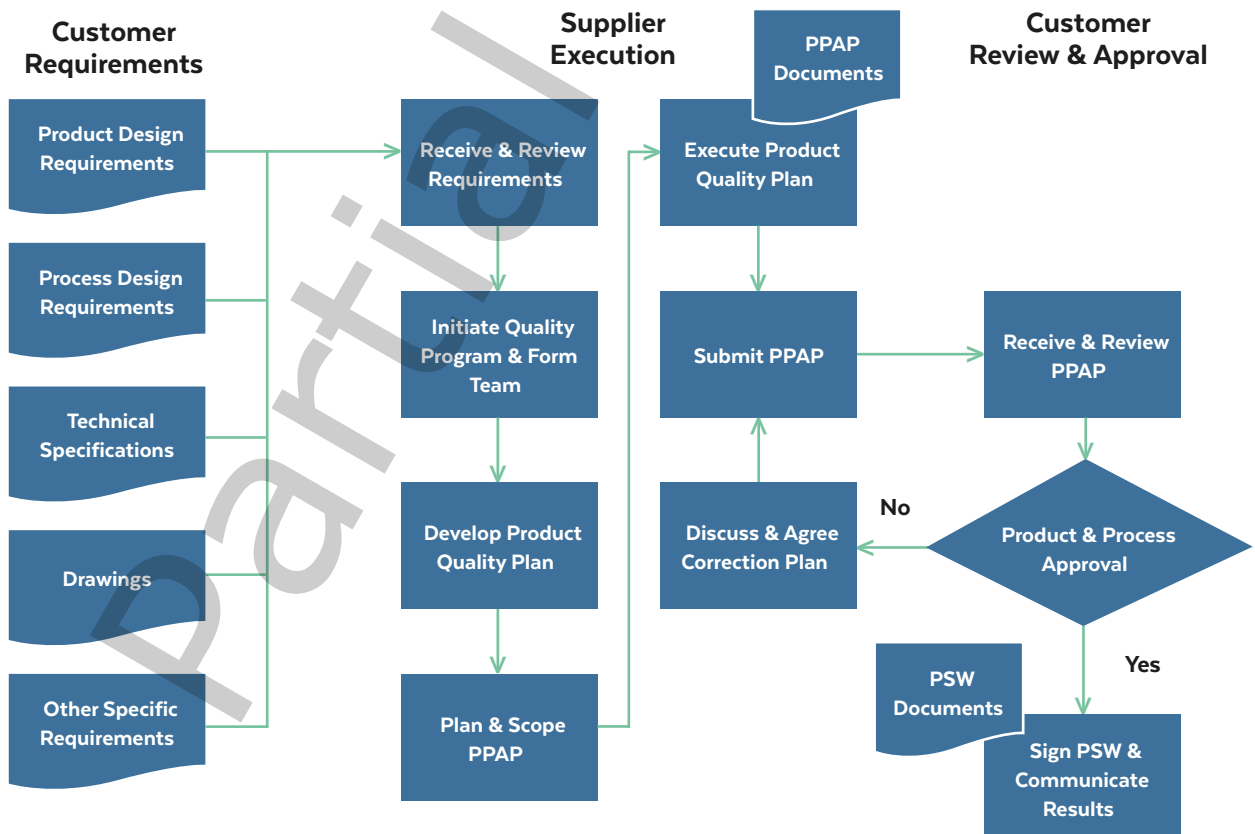
这类供应商不负责产品设计,而是负责根据图纸、规范和客户要求制造产品。该类别还包括根据客户要求对客户材料实施特定过程(如热处理、表面处理等)的供应商。

APQP4Wind Framework

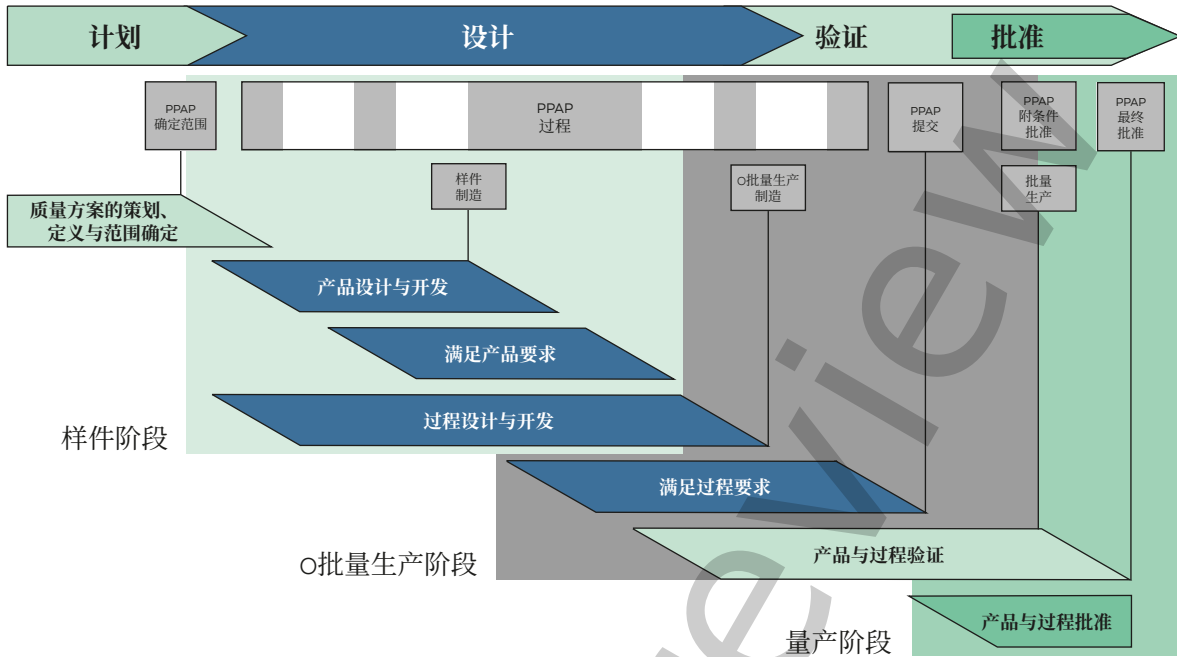


The above graphic shows the 3 stages of the 7 phases of APQP4Wind. Each phase will be described in more detail in subsequent sections of this Manual.

APQP4Wind Process Flow

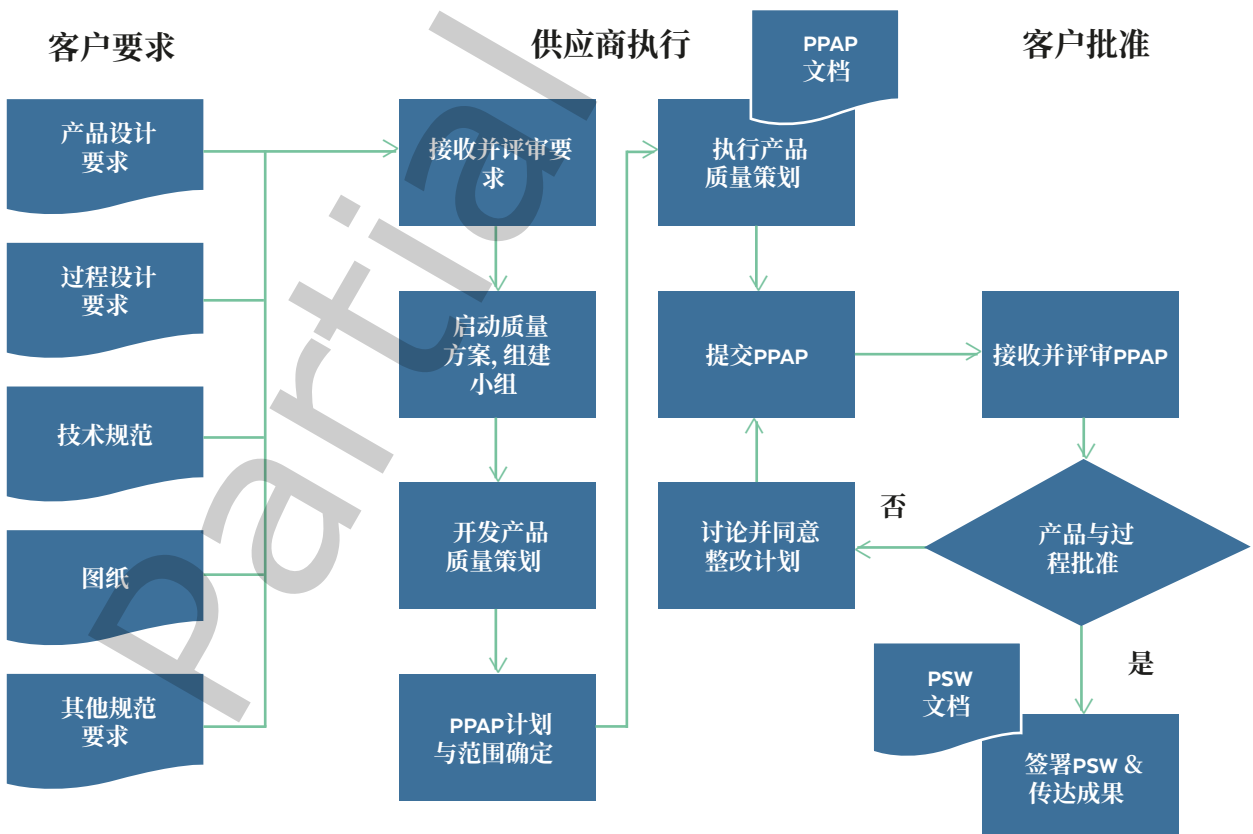


APQP4Wind框架



上图所示为APQP4Wind 7阶段中的3个阶段
本手册后续章节将对各个阶段进行更为详尽的阐述。

APQP4Wind流程



Phase Input & Output

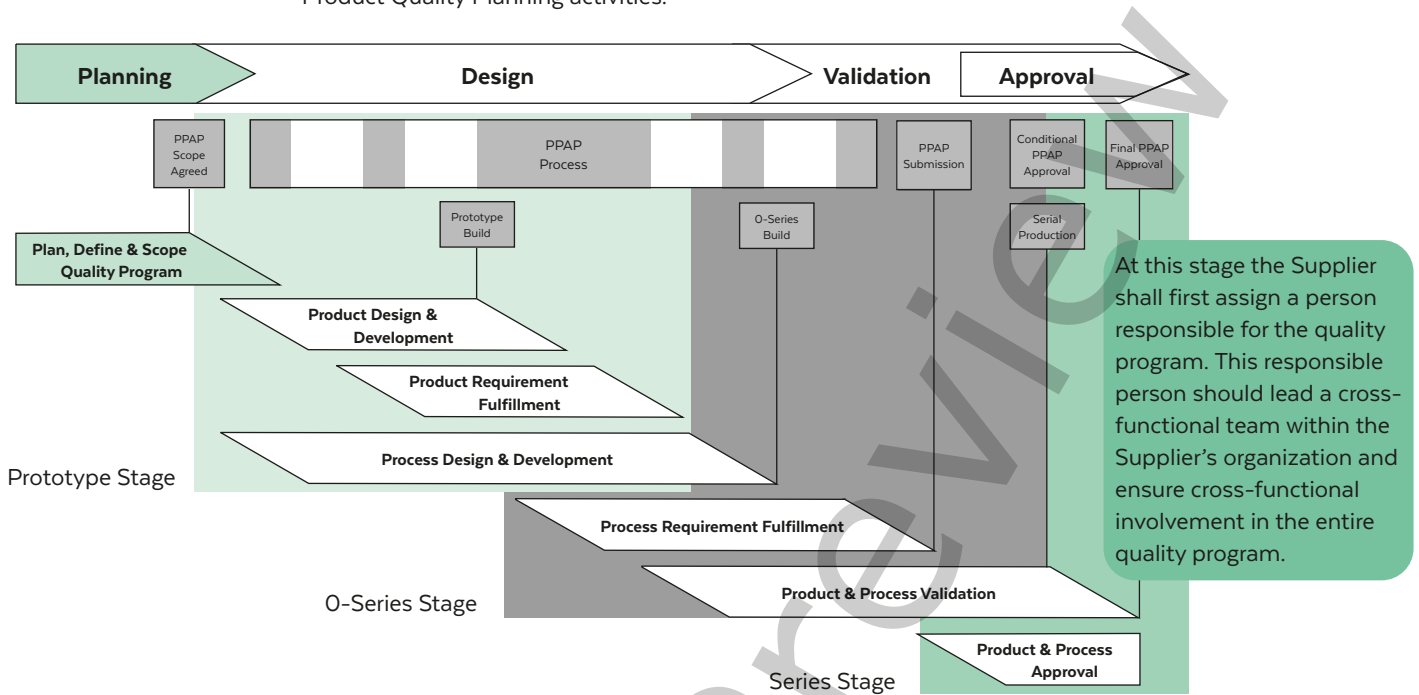
Phases	Input	Output
1.0 Plan, Define & Scope Quality Program	1.1 Voice of Customer	1.2 Design Goals
	1.3 Product & Process Benchmark Data	1.6 Sub-Supplier Screening
	1.4 Product & Process Assumptions	1.7 APQP Kickoff
	1.5 Historical Data & Quality Information	1.8 Product Quality Planning Team
		1.9 Product Quality Plan (PQP)
2.0 Product Design & Development	Input	Output
	1.2 Design Goals	2.1 Engineering Design Review (EDR)
	1.6 Sub-Supplier Screening	2.2 Drawing & Specification Review
	1.7 APQP Kickoff	2.3 Team Feasibility Commitment (TFC)
	1.8 Product Quality Planning Team	2.4 DFMEA (Design Failure Mode & Effects Analysis)
	1.9 Product Quality Plan (PQP)	2.5 Special Characteristics
		2.6 Design for Manufacturability, Assembly, Transport & Service
		2.7 Design Verification Plan (DVP)
		2.8 New Equipment, Tooling, Gauge/Test & Facilities Requirement
		2.9 Preliminary BOM & BOM Management
		2.10 Sub-Supplier Assessments
	2.11 Engineering Change Management (ECM)	
3.0 Product Requirement Fulfillment	Input	Output
	2.1 Engineering Design Review (EDR)	3.1 Design Verification Report (DVR)
	2.2 Drawing & Specification Review	3.2 Tool Design & Approval
	2.3 Team Feasibility Commitment (TFC)	3.3 Sub-Supplier Product Quality Plan
	2.4 DFMEA (Design Failure Mode & Effects Analysis)	3.4 Customer Engineering Approval
	2.5 Special Characteristics	3.5 Prototype Control Plan
	2.6 Design for Manufacturability, Assembly, Transport & Service	3.6 Prototype Builds
	2.7 Design Verification Plan (DVP)	
	2.8 New Equipment, Tooling, Gauge/Test & Facilities Requirement	
	2.9 Preliminary BOM & BOM Management	
	2.10 Sub-Supplier Assessments	
2.11 Engineering Change Management (ECM)		
4.0 Process Design & Development	Input	Output
	2.1 Engineering Design Review (EDR)	4.1 Preliminary Process Flow Chart & Floor Plan
	2.2 Drawing & Specification Review	4.2 PFMEA (Process Failure Mode & Effects Analysis)
	2.3 Team Feasibility Commitment (TFC)	4.3 MSA Plan (Measurement System Analysis)
	2.4 DFMEA (Design Failure Mode & Effects Analysis)	4.4 Preliminary Process Capability Study Plan
	2.5 Special Characteristics	4.5 Packaging & Transport Specifications
	2.6 Design for Manufacturability, Assembly, Transport & Service	
	2.7 Design Verification Plan (DVP)	
	2.8 New Equipment, Tooling, Gauge/Test & Facilities Requirement	
	2.9 Preliminary BOM & BOM Management	
	2.10 Sub-Supplier Assessments	
	2.11 Engineering Change Management (ECM)	
	3.1 Design Verification Report (DVR)	
	3.2 Tool Design & Approval	
	3.3 Sub-Supplier Product Quality Plan	
	3.4 Customer Engineering Approval	
3.5 Prototype Control Plan		
3.6 Prototype Builds		
5.0 Process Requirement Fulfillment	Input	Output
	4.1 Preliminary Process Flow Chart & Floor Plan	5.1 Process Flow Chart & Floor Plan
	4.2 PFMEA (Process Failure Mode & Effects Analysis)	5.2 Production Tool Builds
	4.3 MSA Plan (Measurement System Analysis)	5.3 O-Series Control Plan
	4.4 Preliminary Process Capability Study Plan	5.4 Work Instructions
	4.5 Packaging & Transport Specifications	5.5 Preliminary Process Capability Study
	5.6 Sub-Supplier PPAP Completion	
6.0 Product & Process Validation	Input	Output
	5.1 Process Flow Chart & Floor Plan	6.1 O-Series Production
	5.2 Production Tool Builds	6.2 Performance Test Report & Certification
	5.3 O-Series Control Plan	6.3 Material Test Report & Certification
	5.4 Work Instructions	6.4 Dimensional Report
	5.5 Preliminary Process Capability Study	6.5 Appearance Approval Report
	5.6 Sub-Supplier PPAP Completion	6.6 MSA Report (Measurement System Analysis)
		6.7 Product Validation Testing
		6.8 Form, Fit & Function (FFF)
		6.9 Serial Production Control Plan
	6.10 Packaging & Transport Evaluation	
7.0 Product & Process Approval	Input	Output
	6.1 O-Series Production	7.1 PPAP Documentation (Production Part Approval Process)
	6.2 Performance Test Report & Certification	7.2 Master Samples
	6.3 Material Test Report & Certification	7.3 PPAP Submission & PSW (Part Submission Warrant)
	6.4 Dimensional Report	
	6.5 Appearance Approval Report	
	6.6 MSA Report (Measurement System Analysis)	
	6.7 Product Validation Testing	
	6.8 Form, Fit & Function (FFF)	
	6.9 Serial Production Control Plan	
6.10 Packaging & Transport Evaluation		

各阶段输入与输出

阶段	输入	输出
1.0 质量方案的 策划、定义与 范围确定	1.1 客户呼声	1.2 设计目标
	1.3 产品与过程基准数据	1.6 次级供应商筛选
	1.4 产品与过程假设	1.7 APQP启动
	1.5 历史数据与质量信息	1.8 产品质量策划小组
		1.9 产品质量策划(PQP)
	输入	输出
2.0 产品设计 与开发	1.2 设计目标	2.1 工程设计评审(EDR)
	1.6 次级供应商筛选	2.2 图样与规范评审
	1.7 APQP启动	2.3 小组可行性承诺(TFC)
	1.8 产品质量策划小组	2.4 设计失效模式和效果分析(DFMEA)
	1.9 产品质量策划(PQP)	2.5 特殊特性
		2.6 可制造性、装配、运输和服务设计
		2.7 设计验证计划(DVP)
		2.8 新设备、工具、量具/测试和设施要求
		2.9 初始材料清单(BOM)与材料清单管理
		2.10 次级供应商评估
		2.11 工程变更管理(ECM)
	输入	输出
3.0 满足产 品要求	2.1 工程设计评审(EDR)	3.1 设计验证报告(DVR)
	2.2 图样与规范评审	3.2 工装设计与批准
	2.3 小组可行性承诺(TFC)	3.3 次级供应商产品质量策划
	2.4 设计失效模式和效果分析(DFMEA)	3.4 客户工程批准
	2.5 特殊特性	3.5 样件控制计划
	2.6 可制造性、装配、运输和服务设计	3.6 样件制造
	2.7 设计验证计划(DVP)	
	2.8 新设备、工具、量具/测试和设施要求	
	2.9 初始材料清单(BOM)与材料清单管理	
	2.10 次级供应商评估	
	2.11 工程变更管理(ECM)	
	输入	输出
4.0 过程设计 与开发	2.1 工程设计评审(EDR)	4.1 初始工艺流程图与平面布置图
	2.2 图样与规范评审	4.2 过程失效模式和效果分析(PFMEA)
	2.3 小组可行性承诺(TFC)	4.3 测量系统分析(MSA)计划
	2.4 设计失效模式和效果分析(DFMEA)	4.4 初始过程能力研究计划
	2.5 特殊特性	4.5 包装与运输规范
	2.6 可制造性、装配、运输和服务设计	
	2.7 设计验证计划(DVP)	
	2.8 新设备、工具、量具/测试和设施要求	
	2.9 初始材料清单(BOM)与材料清单管理	
	2.10 次级供应商评估	
	2.11 工程变更管理(ECM)	
	输入	输出
5.0 满足过 程要求	4.1 初始工艺流程图与平面布置图	5.1 工艺流程图与平面布置图
	4.2 过程失效模式和效果分析(PFMEA)	5.2 制造生产工具
	4.3 测量系统分析(MSA)计划	5.3 O批量生产控制计划
	4.4 初始过程能力研究计划	5.4 作业指导书
	4.5 包装与运输规范	5.5 初始过程能力研究
		5.6 次级供应商完成PPAP
	输入	输出
6.0 产品与过 程验证	5.1 工艺流程图与平面布置图	6.1 O批量生产
	5.2 制造生产工具	6.2 性能测试报告与认证
	5.3 O批量生产控制计划	6.3 材料测试报告与认证
	5.4 作业指导书	6.4 尺寸报告
	5.5 初始过程能力研究	6.5 外观批准报告
	5.6 次级供应商完成PPAP	6.6 测量系统分析(MSA)报告
		6.7 产品验证测试
		6.8 形式、装配及功能(FFF)
		6.9 批量生产控制计划
		6.10 包装与运输评估
	输入	输出
7.0 产品与过 程批准	6.1 O批量生产	7.1 生产件批准程序(PPAP)文档
	6.2 性能测试报告与认证	7.2 标准样品
	6.3 材料测试报告与认证	7.3 PPAP提交与部件提交保证(PSW)
	6.4 尺寸报告	
	6.5 外观批准报告	
	6.6 测量系统分析(MSA)报告	
	6.7 产品验证测试	
	6.8 形式、装配及功能(FFF)	
	6.9 批量生产控制计划	
	6.10 包装与运输评估	

Phase 1. Plan, Define & Scope Quality Program

This phase describes the requirements to initiate a quality program by understanding the needs, requirements and expectations of the Customer, and scoping and planning the Product Quality Planning activities.



As a minimum, the Supplier shall:

- Understand the Customer's expectations.
- Identify potential constraints and risks in fulfilling the Customer's requirements.
- Identify cost and timeline for on-time delivery of product.
- Determine any assistance required from the Customer.
- Identify potential Suppliers and Sub-Suppliers and processes to fulfill requirements.

The Customer shall provide all necessary documents pertaining to the requirements and specifications to the Supplier. These may include, but are not limited to, technical specifications, drawings and standards. The Supplier shall analyze and review the requirements and expectations and use this review as a vital input to plan the quality program.

1.1. Voice of Customer

The Voice of Customer (VoC) is a collective insight into the Customer's needs, expectations, perceptions, and preferences gained through the gathering of information obtained from the Customer and the Supplier's knowledge and experience.

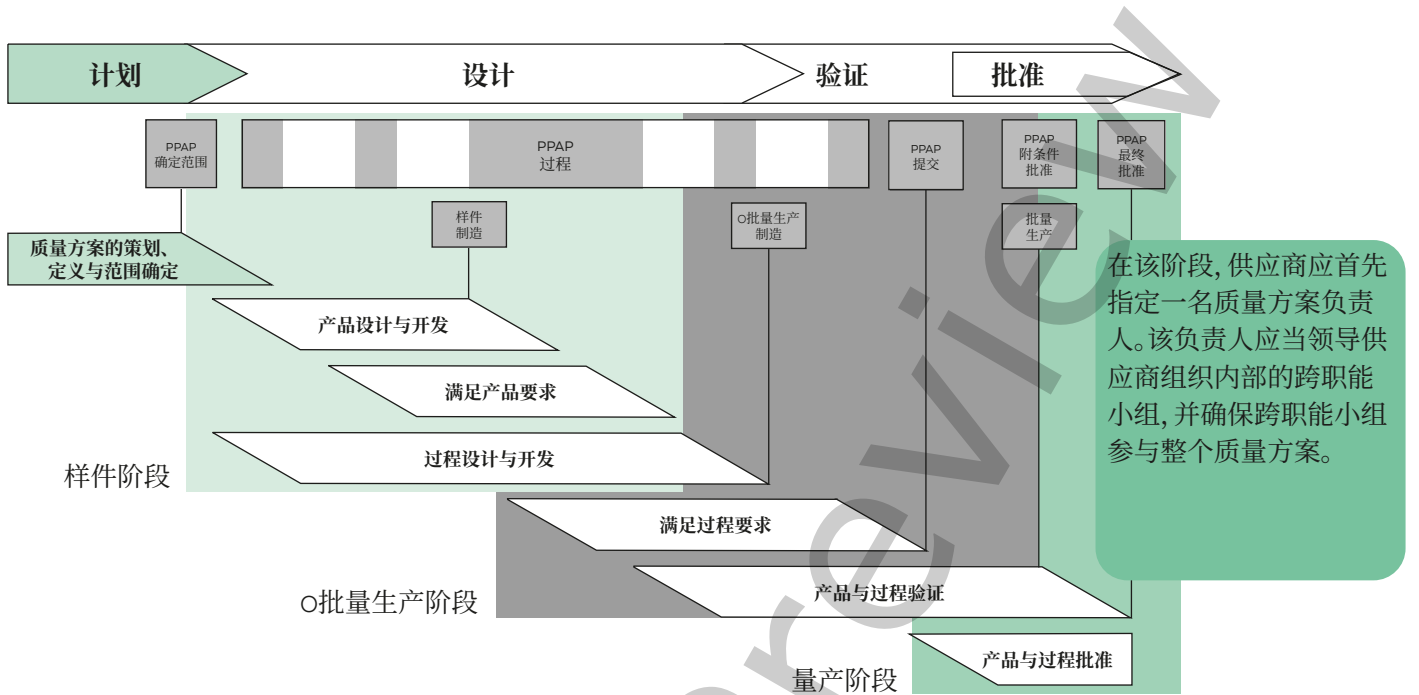
Means used to capture this information include:

- Surveys.
- Stakeholder interviews.
- Things Gone Right (TGR) report & Things Gone Wrong (TGW) report.
- Management comments and direction.
- Lessons learned records.

The information discovered should be translated into meaningful objectives that help in closing any gaps between the Customer's expectations and the Supplier's offerings.

第1阶段 质量方案的策划、定义与范围确定

本阶段介绍了如何根据客户的需求、要求和期望启动质量方案,并确定与产品质量策划相关的活动。



供应商至少应做到:

- 理解客户期望。
- 找出在满足客户要求的过程中潜在的障碍和风险。
- 确定按时交付产品所需要的成本和时间。
- 确定客户所需的帮助。
- 确定满足客户要求所需要的供应商和次级供应商, 以及必要过程。

客户应向供应商提供必要文件, 以说明客户要求和规范。这些文件可能包括但不限于技术规范、图纸和标准。供应商应对客户要求和期望进行分析和评审, 并以此作为计划质量策划的重要输入。

1.1. 客户呼声

客户呼声 (VoC) 是指, 通过收集客户信息以及供应商的知识与经验, 全方位洞察客户的需求、期望、认知和偏好。

信息收集方法包括:

- 调查。
- 利益相关人访谈。
- 运行情况良好 (TGR) 报告与运行情况不良 (TGW) 报告。
- 管理意见与指导。
- 经验教训记录。

收集到的信息应当被转化为行之有效的目标, 以弥补供应商产品与客户期望之间的差距。