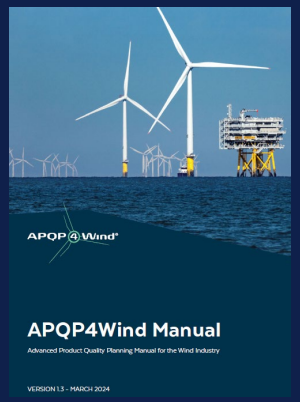
WHEN TRUST MATTERS

Update - The important changes to new APQP4Wind Manual 1.3

What has been changed and how does it affect the APQP4Wind process



Flemming Skov Iversen, Lead Auditor

Welcome

- The webinar will start shortly, check that you have sound on your computer or headset
- Your microphone has been automatically muted
- You can ask questions by use of the ”questions panel” We will answer questions during the Q&A session
- The webinar will be recorded og made available for all participants one of the coming days

Presenter

Flemming Skov Iversen

- With a background of more than 30 years of international experience in leadership and quality functions within automotive, renewable energy and certification, among others in Vestas and LM Wind Power, Flemming Skov Iversen has a solid knowledge and experience base to assess, support and help companies develop their strategies and action plans to drive quality excellence and the effectiveness of product, process and business-related processes.

- During the years 2014-2019 Flemming was part of the Steering Committee and Working Group that developed and launched the APQP4Wind scheme. Since 2019 Flemming is part of the team with DNV Business Assurance Denmark working as Lead Auditor and qualified Lead Trainer in our global APQP4Wind Training Academy having trained more than 1,000 APQP4Wind Managers and Specialists since the launch of the APQP4Wind project.

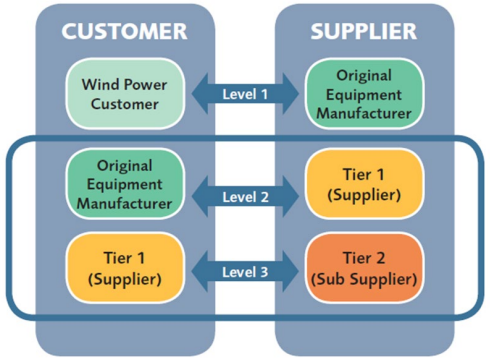
APQP4Wind - Update on APQP4Wind Manual 1.3

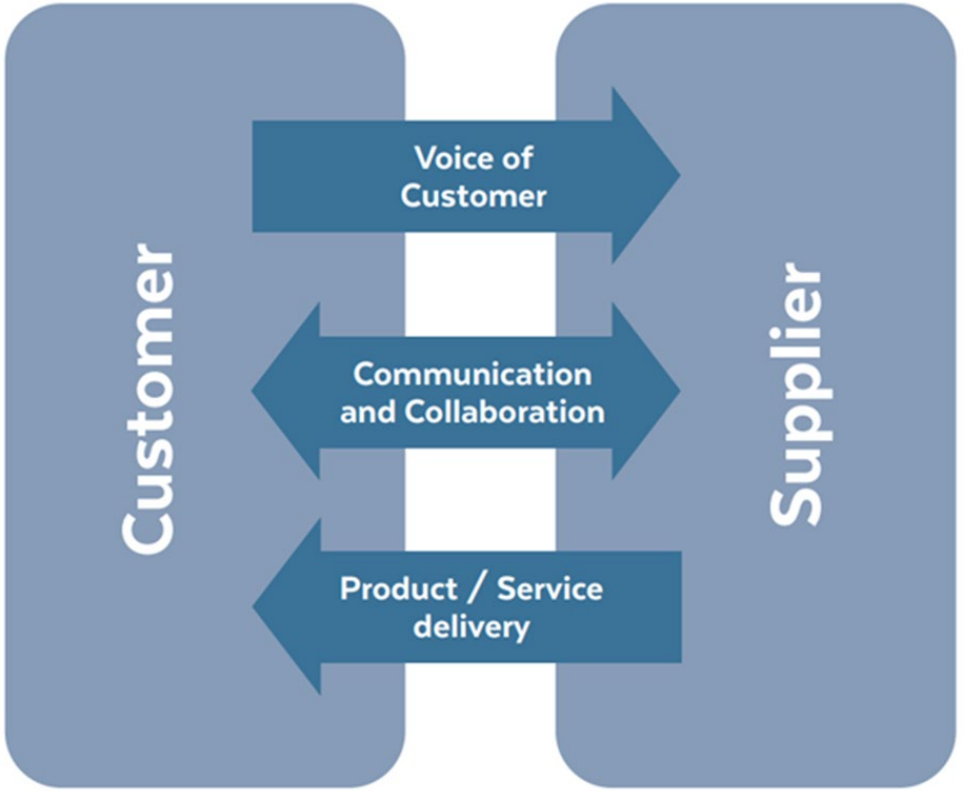
1. Welcome (5 min)
2. Change of APQP4Wind Scope & Purpose (8 min)
3. 2 New elements (10 min)
4. Small changes – but important (10 min)
5. How to get more knowledge (2 min)
6. Q&A (10 min)

APQP4Wind – The scope

In 2024, in connection with utility companies joining APQP4Wind, the Manual was updated to cover the entire wind industry, changing focus from Customer - OEM - Supplier relationship to describing a Customer - Supplier relationship.

All organizations in the value chain is included.





APQP4Wind the purpose extended

Change

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 improve performance, reduce risk, lower the costs of poor quality, and keep pace with the ongoing trend towards decreases in the Levelized Cost of Energy (LCoE) within the wind industry.

The APQP4Wind Manual aims to make the process of product quality assurance demands and the 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 planning and executing quality assurance in the whole value chain.

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APQP4Wind – Changes between edition 1.2 and 1.3

- Update of manual covers several smaller, but important changes, as well as 2 new elements.
- The 2 new elements are:
  - Capacity planning and contingency plans – Section 2.4
  - Process Special Characteristics – Section 4.3

Find the full change log on the APQP4Wind webpage:
https://apqp4wind.org/files/media/document/Changelog%201.3.xlsx

APQP4Wind – Capacity and Contingency planning

New element

2.4. Capacity Planning & Contingency Planning

The organization shall have a documented process for capacity planning. The process shall include a feasibility study determining resources and needs.

The organization shall have a documented process for contingency planning. The process shall identify and evaluate internal and external risks to, but not limited to, production processes, infrastructure, equipment, and logistical setup essential to maintaining contractual delivery obligations. The process shall include contingency plans for continuity of supply and ensure that customer requirements are met. The contingency plans shall be tested periodically for effectiveness and robustness.

Capacity planning is the process of determining the capacity needed by an organization to meet demands for its products, design capacity or other obligations.
What are the maximum resources capable of completing in a given period?

A **contingency plan**, also known as **Plan B**, is a plan often used for risk management for an exceptional risk that, though unlikely, would have severe consequences.

APQP4Wind – Process Special Characteristics

New element

4.3. Process Special Characteristics

The Supplier shall ensure that the Special Characteristics identified during the PFMEA are captured and controlled.

The Supplier shall communicate to the Customer any potential Special Characteristics that have been identified in their process design. The Supplier shall communicate to Sub-Suppliers any Special Characteristics identified by the Customer and the Supplier. Potential Special Characteristics identified by the Sub-Supplier in its product or process design shall be communicated to the Supplier for further communication to the Customer (see also 2.6 Special Characteristics).

Clarity added to manual

DNV

APQP4Wind - Responsibility matrix

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

Responsibility Matrix and Supplier Nature

- Design / Engineering
- Design and Manufacturing
- Manufacturing to Specification
- Service, Logistics, Installation

Capacity and Contingency planning

Process Special Characteristics

Capacity and contingency plans are added as new relevant elements in the PPAP documentation.

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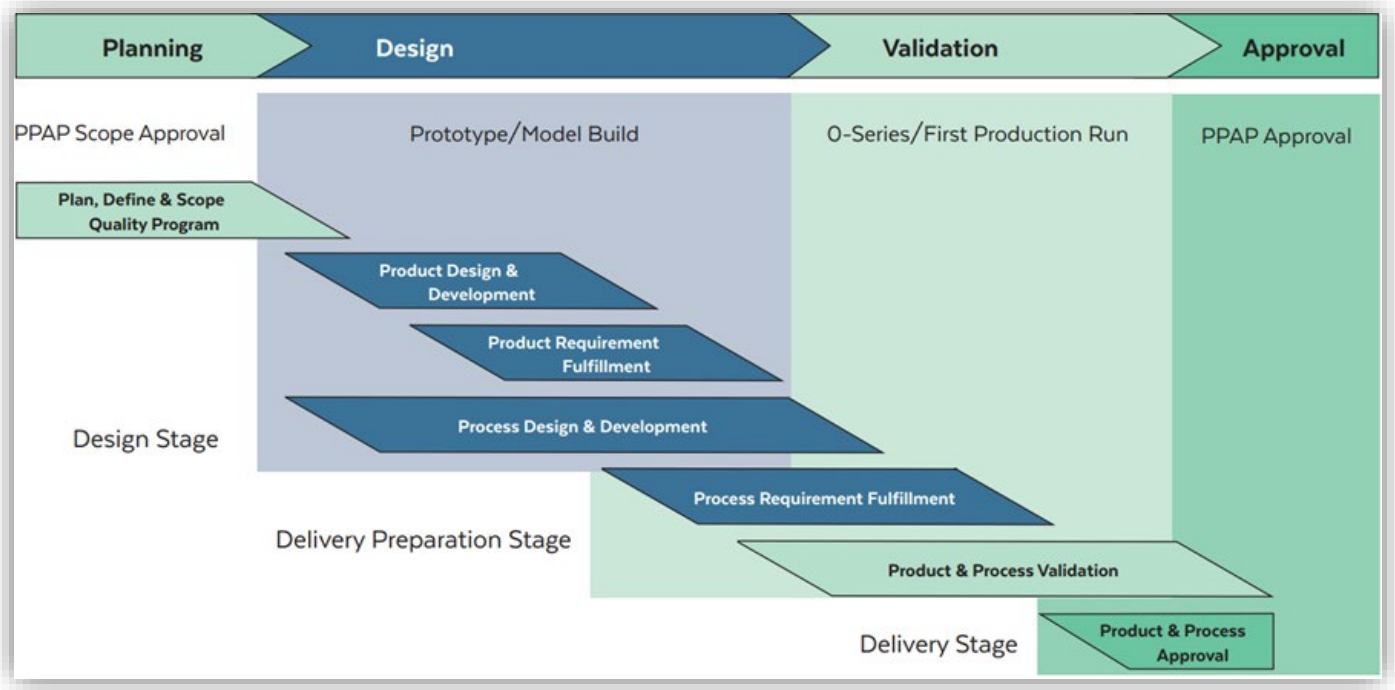
APQP4Wind - Small but important

APQP4Wind - 7 phase framework



Updated graphics

3 Stages, 7 phases and 52 elements

The APQP4Wind framework is made up of 3 stages, 7 phases with 52 elements that cover the APQP process from the first actions in quality planning till PPAP submission and approval.

Omission of HSE removed - is part of FMEA

APQP4Wind – Small but important

From could to may

1.6. Sub-Supplier Screening

Where applicable, the Supplier should identify potential processes that may be outsourced to a Sub-Supplier. Based on this input, the relevant Sub-Suppliers capable of fulfilling the product/process requirements should be screened by the Supplier. Here, screening refers to identifying all potential Sub-Suppliers who can fulfill the requirements.

APQP4Wind - Small but important

1.7. APQP4Wind Kickoff

The APQP4Wind Kickoff is a formal meeting between the Supplier and the Customer in which the Product Quality Planning activities are initiated. The various quality deliverables and timelines defined by the Customer shall be discussed and agreed upon in this meeting. The Supplier shall document the outcomes of this meeting. A common procedure for a successful Kickoff meeting can be divided into four steps:

- Presentation of ideas, sketches, drawings, technical data, requirements, specifications, etc.
- Development of an adequate Pre-PQP with milestones (timeline) for Design, Delivery Preparation and Delivery Stage.
- Clarification of documentation transfer and reporting (contacts, frequency, information type, and escalation plan).
- Content of Production Part Approval Process (PPAP).

Design added

APQP4Wind - Small but important

New Wording

3.3. Out-Sourced Product with Special Characteristics

The organization shall ensure that Suppliers, who supply products, services, or processes identified as critical by the organization or the Customer, work according to the APQP4Wind Manual. The organization shall ensure that identified Special Characteristics, and the Customer's Special Characteristics and specific requirements are communicated effectively and executed through a structured quality plan for the Supplier delivery.

APQP4Wind - Small but important

From should to shall

5.4. Work Instructions

The organization shall ensure that relevant work instructions, which describe the steps/ procedure to be followed to execute the process, are available in the process area.

The following are the minimum requirements for the Supplier:

- Work instructions shall be easily understood (available in the national language of the respective production site) and be accessible at the workplace.
- The procedures and instructions for managing non-conforming products should be available and easily understood, as mentioned above.
- All employees shall be trained or instructed in the tasks they are to perform.
- Work instructions shall be prepared and under document control.
- Work instructions shall be linked to the Control Plan where relevant.

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APQP4Wind - Small but important

Process Failure Mode & Effects Analysis (PFMEA)

Process Failure Mode and Effects Analysis (PFMEA) is aimed at identifying possible safety or regulatory concerns, process failures that impact the product quality/process efficiency/ Customer satisfaction and its mitigation actions.
In its most rigorous form, a PFMEA is a summary of the team's thoughts as a process is developed, including an analysis of items or areas that can go wrong based on experience.

The PFMEA:

- Identifies the process functions and requirements.
- Identifies potential process-related failure modes.
- Assesses the effects of the potential failures on the Customer.
- Identifies the potential causes for process failures.
- Identifies process variables on which to focus the process controls for occurrence reduction or for detection of the failure conditions.
- Develops a ranked list of potential failure modes, thus establishing a priority system for preventive/corrective action considerations.

The PFMEA assumes that the product as designed shall meet the design intent. Potential failure modes that can occur because of a design weakness may be included in a PFMEA and are derived from DFMEA as Special Characteristics.

Wording to meet scope

From will to shall

APQP4Wind - Small but important

DFMEA - SEVERITY RANKING		
Severity: *Effect of the failure mode on the product. The effect should always be evaluated without regard to occurrence or detection.*		
Ranking	**Effect**	**Criteria**
10	Hazard	Affects safety of any party in the value chain.
9	Non-compliance	Leads to non-compliance with government regulations and/or legal requirements.
8	Primary function loss/major impact	Potential loss of primary function of system without early warning, and/or major production loss or business impact.
7		Potential loss of primary function of system with early warning.
6	Primary function degradation	Degradation of primary function: • System is operable but at a reduced level of performance. • It may lead to early repair or replacement.
5	Secondary function loss	Loss of secondary function of system, but primary function and its performance level are unaffected.
4	Secondary function degradation	Degradation of secondary function of system, but primary function and its performance level are unaffected.
3	Annoyance	Appearance, noise level or other feature of system does not conform to Customer expectations and is/are easily noticeable.
2	Annoyance	Appearance, noise level or other feature of system does not conform to Customer expectations and is/are not easily noticeable.
1	Nil effect	No discernible effect.

Text in scoring tables has been updated to support the scope of entire value chain

How can we support you?
DNV - APQP4Wind Academy

DNV is approved by APQP4Wind as
one of three global providers of training
to support the deployment of the APQP4Wind.
http://www.dnv.com/apqp4wind

Sign up for a Refresher training and be updated on the new manual 1.3

Upcoming Courses:

APQP4Wind Management Awareness Training, 13 May (Europe), 24 May (Brazil), 3 June (USA), 10 June (Europe)

APQP4Wind Specialist Training, 14-17 May (Europe), 20-23 May (Brazil), 27-30 May (China), 4-7 June (USA), 11-14 June (Europe)

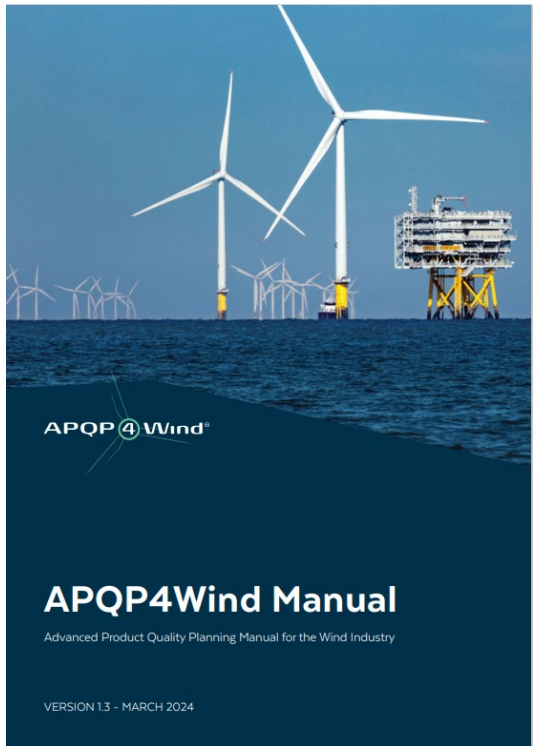
APQP4Wind Refresher Training, 23 April (Europe), 14 June (Brazil), 20 June (Europe), 22 August (China)

See full training calendar **here**

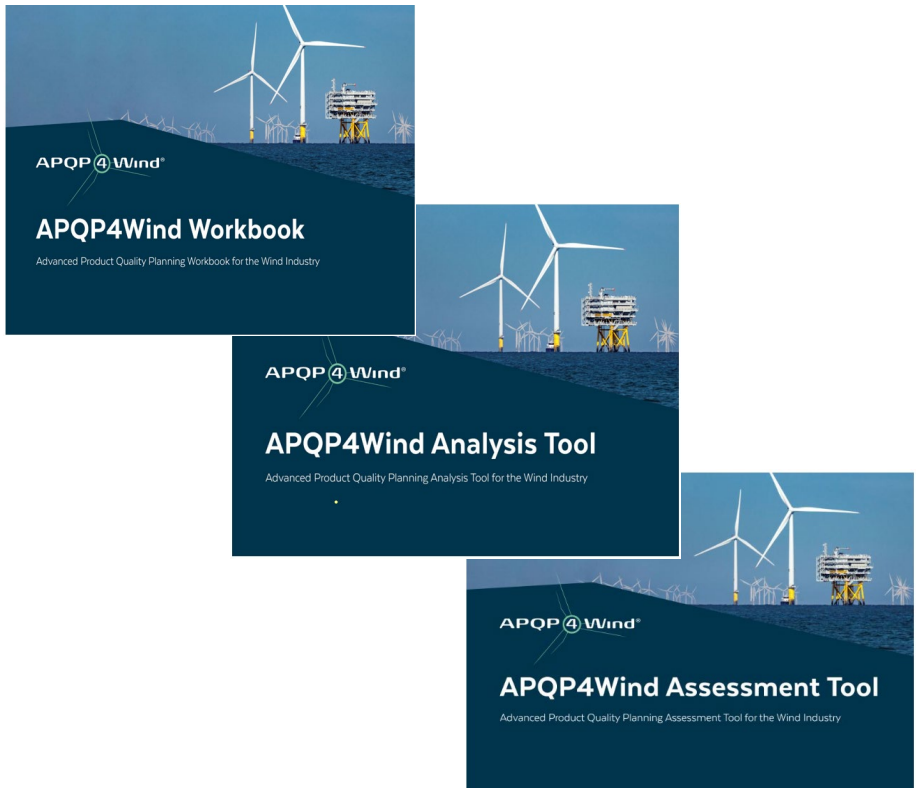
APQP4Wind Resources to support you

The APQP4Wind Manual is not only a requirement document but also a resource supported by guidelines, PPAP workbook and training resources. For more information visit the APQP4Wind website: http://www.apqp4wind.org

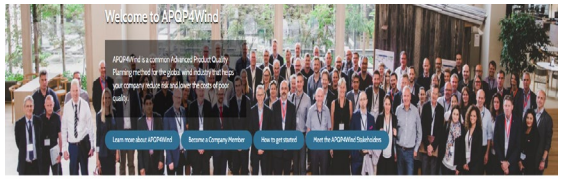
APQP4Wind Manual
Available in English



APQP4Wind Toolbox
Workbook, Analysis Tool & Assessment Tool



APQP4Wind online
Website & LinkedIn



Endorsed by

Questions & Answers

For more information

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https://www.dnv.dk/apqp4wind