



Production Part Approval Process

Supplier Information

→ Quality Standards, June 2025



Production Part Approval Process Navigation

- » What's PPAP?
- meaning
- origin

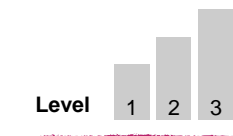


- » Benefits & Targets
- Improve quality cooperation
- Zero failure target Increase customer satisfaction
- confidence in future product Risk reduction
- Part view + Process view design integrity
- Reduce warranty charges smooth SOP managing supplier changes
- standardization Prevents costs for poor quality
- Global approach

- » What has changed?



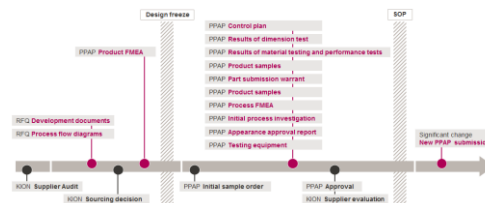
- » PPAP Level



- » PPAP Content

15 different requirements including example

- » PPAP Timeline



- » Additional information

- KION standard
- PPAP website
- contact

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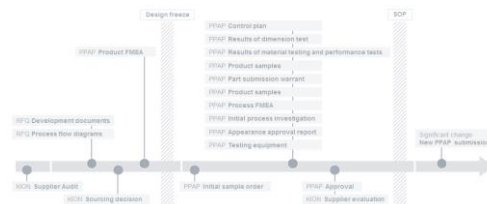
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Production Part Approval Process

What's PPAP?

PPAP

PRODUCTION

PART

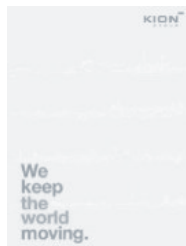
APPROVAL

PROCESS

- ➔ Standard guideline for initial sample release & risk reduction prior to product release
- ➔ Team oriented approach using well established tools and techniques
- ➔ Developed by Ford, Chrysler and General Motor in 1993
- ➔ State of the Art in the Industry

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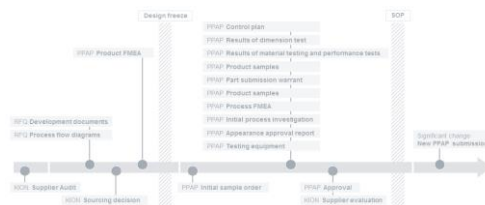
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Production Part Approval Process

Benefits & Targets

Clear specification by KION

Improve quality cooperation

Zero failure target Increase customer satisfaction

confidence in future product **Benefits** Part view + Process view
Risk reduction design integrity

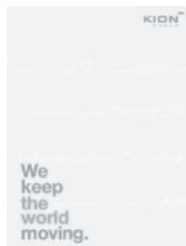
Reduce warranty charges smooth SOP managing supplier changes

standardization **Prevents costs for poor quality**

Global approach

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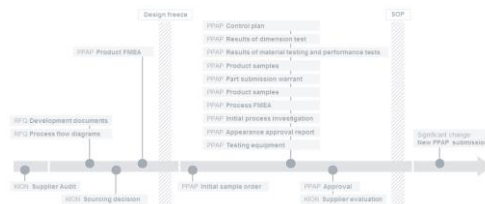
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Production Part Approval Process

What has changed?

What is the past?

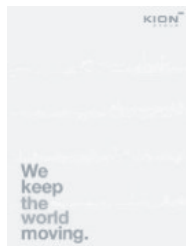
- 3 PPAP Levels
 - 12 requirements (KION ITS) / 10 requirements (KION SCS)
 - Fixed PPAP Scope depending on the PPAP Level
- 
-
- 
- Different PPAP procedures at KION business segments
 - Production Part Approval Process Guidelines (as of November 2010)

What is it like now?

- 3 PPAP Level remain, but requirements scope adjusted
 - new requirements added (including naming adjustments)
 - Scope can be customized by KION, depending on requirements
-
- Harmonized Initial Sample Process for KION business segments (ITS/SCS)
 - New KION Production Part Approval Company Standard (WN50020)

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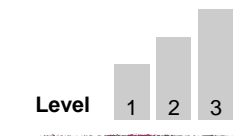
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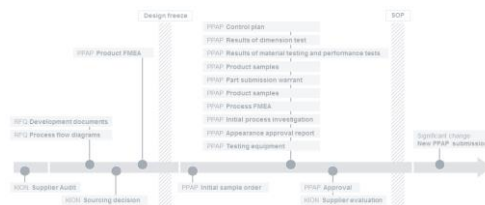
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Production Part Approval Process

PPAP Level

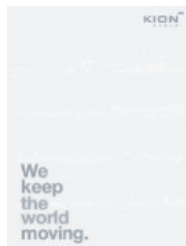
Level	Requirements	
1	PPAP with sample parts and limited data submitted	
2	PPAP with sample parts and extensive data submitted	
3	PPAP with sample parts and complete data submitted	

KION R&D defines the submission level within Teamcenter depending on the following criteria:

- Product Complexity
- Safety relevance of the product
- Developmental Complexity
- Traceability

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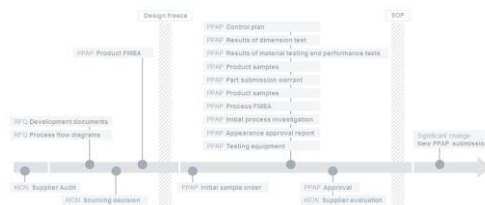
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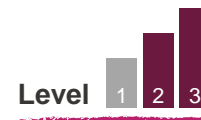
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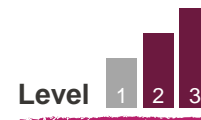
Production Part Approval Process Requirements



	Level 1	Level 2	Level 3
1. Development documents	S	S	S
2. Engineering change documents			R
3. Design FMEA			S
4. Process flow diagrams	S	S	S
5. Process FMEA		R	S
6. Control plan	R	S	S
7. Measurement System Analysis			R
8. Dimension results	S	S	S
9. Results of material testing and performance tests	S	S	S
10. Appearance approval report (if applicable)		S	S
11. Process capability studies		R	S
12. Documentation of qualified laboratory			R
13. Product samples	S	S	S
14. Testing equipment		R	S
15. Part submission warrant (PSW)	S	S	S

S – to be submitted to KION | R – to be available on request

Production Part Approval Process Requirements

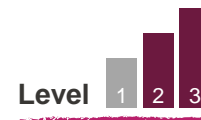


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Production Part Approval Process

Development documents

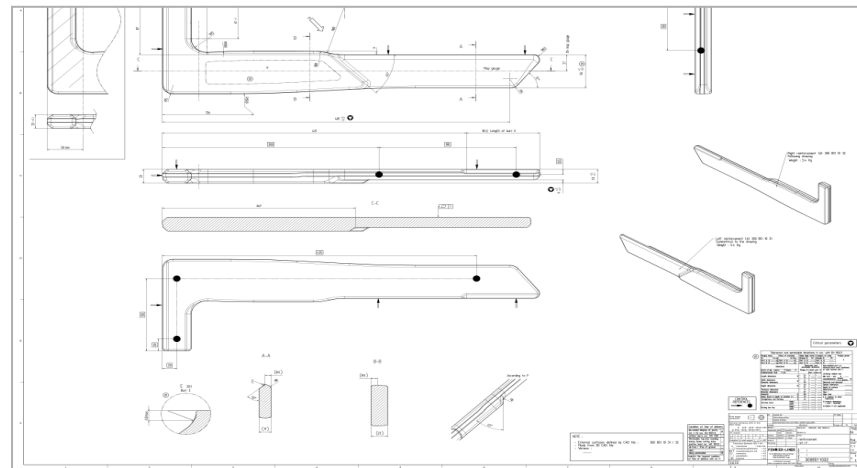


Description

Includes:

- Component drawings
- Assembly drawings
- Bill of Material
- Material specifications
- Functional/ performance specifications
- Further documents

Example



- ➔ Ensures manufacturer has the complete design record at the correct revision levels
- ➔ To be submitted with the quotation

Production Part Approval Process Control plan



Description

- Define measuring and testing methods including sample size/ frequency, testing equipment and documentation
- Includes reaction plan in case characteristic or process parameter is found to be out of control
- Inputs come from the supplier knowhow (Process FMEA , experiments)

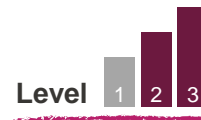
KION Form

<div style="display: flex; justify-content: space-between;"> <div> KION GROUP </div> <div> Produktionslenkungsplan Control Plan </div> <div> Seite 13 von 17 </div> </div>																						
Produktionslenkungsplan-Nr. Control Plan Number			1000			Table-Nr./ letzter Änderungsstand Part Number/ Latest Change Level			2002970101 / 01			Ausgangspunkt/ Teil Key Contact/ Piece			H. Müller / 0021 - 99-0708							
Datum (Erstellung) Date (Orig.)			01.08.2016			Verfahrensbezeichnung Part Name/ Description			Support			Projektteam Core Team			Müller, Müller, Schulte							
Datum (Änderung) Date (Rev.)			15.08.2016			Lieferant/ Werk Supplier/ Plant			Werkaden			Lieferant/ Werk/ Lieferant/ Datum Supplier/ Plant Approval Date			01.09.2016							
						Lieferanten- Nr. Supplier Code			25412			Andere Freigabe (falls gefordert) Other Approval (if req'd)										
Table / Process Number		Prozessschritt/ Arbeitsgang/ Bezeichnung		Maschine, Vorrichtung Workplace zur Fertigung		Methoden Characteristics			Sekundäre Merkmale Classified		Produkt / Prozess Specification / Tolerances		Mess-technik Evaluation Measurement Technique		Mess-system- analyse		Werkzeuge/ Samples		Leistung- methode		Reaktionsplan Reactions	
No.	Product	Process	No.	Product	Process	Special Char. Class.	Product / Process	Specification / Tolerances	Evaluation Measurement Technique	Measurement System Analysis Studies	Uniting Size	Interval Freq.	Control Method	Reaction Plan								
10	Turning operation	5240 Turning machine GMD	13	external thread M12		no	20 +/-1	vernier calliper	Model 1	3	per 1 hour	worker self- inspection	Instruction 4- NOC Parts: 1. Measurement all produced parts to the first usable part 2. Change of the machine parameter 3. Messung erstes Teil mit Freigabe									

→ Ensure that the production process is under control

Production Part Approval Process

Dimension results



Description

- Evidence that **the complete** dimensional check has been performed
- Record results for all specified requirements out of every tool, cavity, production cell or line
- PPAP samples used for dimensional check must be identified

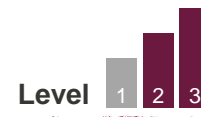
Example

[illegible]

- ➔ If dimensions are not conformed to the specification, the manufacturer informs KION R&D and Quality prior to PPAP submission

Production Part Approval Process

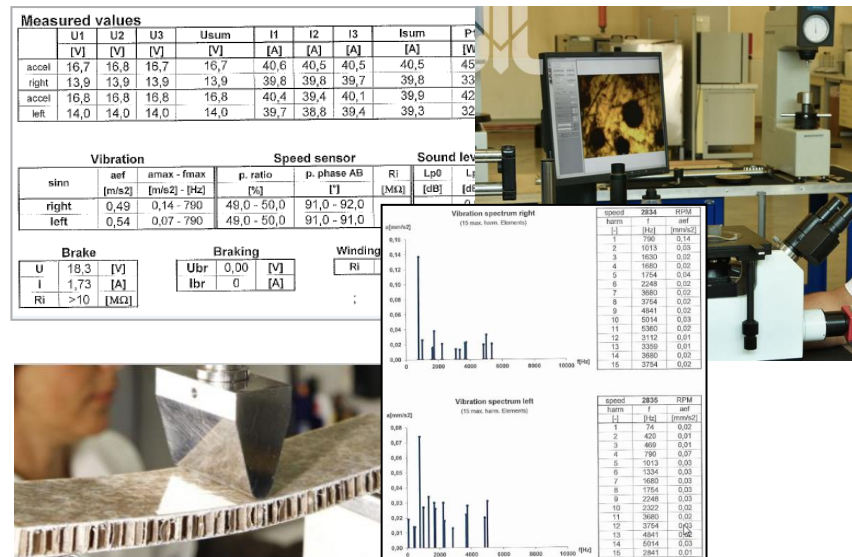
Results of material testing and performance tests



Description

- Evidence that material, performance or functional tests according to requirement (development documents or production control plan) have been performed
- Record results including test report number, date, laboratory that performed the test

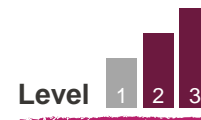
Example



➔ Responsibilities for performance tests are fixed in cooperation with the KION R&D

Production Part Approval Process

Product samples



Description

- Quantity of samples defined by KION
- Clear visual identification of the Product Sample Parts / the Box of the where the parts are included. (See example picture)
- The product samples delivered are the parts that have been measured for the dimensional results

Example for best practice

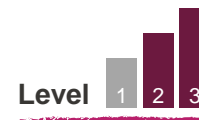
Part Number: _____ ind. _____
Quantity : _____
Order N : _____

Production Part Approval Process (PPAP)

NB : The initial samples shall not be packed with pre-serial or serial parts.

Production Part Approval Process

Part submission warrant (PSW)



Description

- After fulfilling all PPAP requirements, the supplier shall provide the filled Part Submission Warrant
- Each KION Part number requires a new Part Submission Warrant, unless otherwise agreed with KION Quality
- With the part submission warrant, the supplier confirms the design and the processes to manufacture the parts (including quantity of tools cavities, production cells or lines)
- Declaration that the results meet the drawing and specification requirement

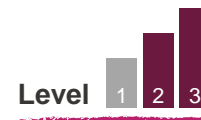
KION Form

Part Submission Warrant (PSW)

Part Name	Disc wheel 4,00E-9 ET25	Cust. Part Number	0009932286
Shown on Drawing No.	MXC DWG. - 15901827 000 45	Org. Part Number	0009932286 / 000 ver. 01
Engineering Change Level	---	Dated	06.02.2024
Additional Engineering Changes	---	Dated	---
Safety and/or Government Regulation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Purchase Order No.	7200057176
Checking Aid No.	---	Checking Aid Engineering Change Level	---
		Weight (kg)	7,50
		Dated	---

ORGANIZATION MANUFACTURING INFORMATION		CUSTOMER SUBMITTAL INFORMATION	
Maxion Wheels Czech s.r.o., division Autokola		Stiil GmbH Factory, Postfach 80 06 42, D-21006 Hamburg	
Organization Name & Supplier/Vendor Code		Customer Name/Division	
Vratimovska 707		Nicole vonGeldern / +49 40 7339 1925 Nicole.vonGeldern@stiil.de	
Street Address		Buyer/Buyer Code	
Ostrava - Kuncice	719 00	Czech Reput	---
City	Region	Postal Code	Country
REASON FOR SUBMISSION		(Check at least one)	
<input checked="" type="checkbox"/> Initial Submission		<input type="checkbox"/> Change to Optional Construction or Material	
<input type="checkbox"/> Engineering Change(s)		<input type="checkbox"/> Supplier or Material Source Change	
		Application	

Production Part Approval Process Requirements



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Production Part Approval Process

Process flow diagrams



Description

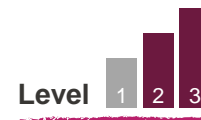
- Designation and clear description of every single process step & sequences required to produce the referenced product

KION Form

KION		Prozessflussdiagramm Process Flow Diagram			
Teil-Nr / Interim Änderungsstand Part Number / Label Change Level	12345678 / 03	Teilbezeichnung Part Name / Description	halter	Datum (Erstellung) Date (Orig.)	01.08.2016
Anspruchspartner Teil, Key Contact Name	Herr Max Mustermann / 00021100xx	Lieferanten-Nr. Supplier Code	1234	Lieferant/ Werk Supplier Plant	Aachfenburg
Legende: Legend: <div style="display: flex; justify-content: space-around; align-items: center;"> ○ Aktivität Operation □ Prüfung Inspection ➡ Transport Transport △ Lagers Storage </div>					
Arbeits- vorgang Step	Arbeitsvorgang oder Ereignis Operation or Event		Beschreibung des Arbeitsvorgangs oder des Ereignisses Description of Operation or Event		
	○ □ ➡ △				
10				X	Goods receipt storage
20			X		Transport production turning machine

- ➔ Provide linkage to Process FMEA and Control Plan
- ➔ Has to be submitted with the quotation

Production Part Approval Process Process FMEA



Description

- **Process Failure Mode and Effects Analysis:**
 - determine the ways in which the Process Steps can go wrong including effects and causes
 - List the current controls for each potential cause
 - Evaluate the risk (RPN – Risk Priority Number)
 - Define recommended actions
- Inputs come from the process flow diagram

KION Form

Failure Mode and Effects Analysis

Customer/Plant / Process name: Counterbalance truck v2
 Process: Support - turning operation
 Project: 01-26-2016
 Support: 07-28-2016
 Release in charge: Manufacturing
 Customer: Manufacturing - Dep 1
 Release: before SOP
 Status: in progress

No.	Component / Function / Process	Potential failure mode	Potential effects of failure	Potential failure causes	Current process control	Severity	Occurrence	Detection	Recommended Action	Responsibility	Target date	Current process control	Severity	Occurrence	Detection	RPN
1	Turning operation 1	Dimension is below tolerance	Press fit between holder and pin not possible	Incorrectly adjusted tool	Visual inspection of the tooling	5	5	4	Visual tool prescaler	Müller	17.08.2016	Visual tool prescaler	1	5	4	20
2		Dimension is above tolerance	Support part applicable in the pin hole	Incorrectly measurement of the tooling	Visual inspection of the tooling	5	5	4	Visual tool prescaler	Müller	17.08.2016	Visual tool prescaler	1	5	4	20
3						5	5	4	Visual tool prescaler	Müller	17.08.2016	Visual tool prescaler	1	5	4	20
4						5	5	4	Visual tool prescaler	Müller	17.08.2016	Visual tool prescaler	1	5	4	20
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7						5	5	4	Visual tool prescaler	Müller	17.08.2016	Visual tool prescaler	1	5	4	20
8						5	5	4	Visual tool prescaler	Müller	17.08.2016	Visual tool prescaler	1	5	4	20
9						5	5	4	Visual tool prescaler	Müller	17.08.2016	Visual tool prescaler	1	5	4	20
10						5	5	4	Visual tool prescaler	Müller	17.08.2016	Visual tool prescaler	1	5	4	20

Severity

5

X

Occurrence

4

X

Detection

2

=

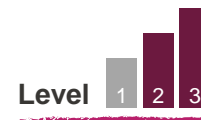
RPN

40

- ➔ Supplier to develop a P-FMEA in accordance with the KION development documents & requirements
- ➔ Carry over process controls and recommended actions into the control plan

Production Part Approval Process

Appearance approval report



Description

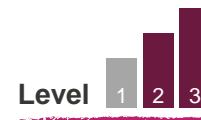
- Only suitable for products with color, grain or surface appearance requirement
- Appearance approval for families or individual parts is acceptable

KION Form

APPEARANCE APPROVAL REPORT																		KION GROUP				
PART NUMBER						DRAWING NUMBER						APPLICATION										
PART NAME						BUYER CODE						E/C LEVEL				DATE						
SUPPLIER NAME						MANUFACTURING LOCATION						SUPPLIER CODE										
REASON FOR SUBMISSION						<input type="checkbox"/> PART SUBMISSION WARRANT <input type="checkbox"/> PRE TEXTURE						<input type="checkbox"/> SPECIAL SAMPLE <input type="checkbox"/> FIRST PRODUCTION SHIPMENT						<input type="checkbox"/> RE-SUBMISSION <input type="checkbox"/> ENGINEERING CHANGE		OTHER		
APPEARANCE EVALUATION																						
ORGANIZATION SOURCING AND TEXTURE INFORMATION														PRE-TEXTURE EVALUATION		AUTHORIZED CUSTOMER REPRESENTATIVE SIGNATURE AND DATE						
														CORRECT AND PROCEED								
														CORRECT AND RESUBMIT								
														APPROVED TO ETCH/TOOL/EDM								
COLOR EVALUATION																						
COLOR SUFFIX	TRISTIMULUS DATA					MASTER NUMBER	MASTER DATE	MATERIAL TYPE	MATERIAL SOURCE	HUE				VALUE		CHROMA	GLOSS		METALLIC BRILLIANCE		COLOR SHIPPING SUFFIX	PART DISPOSITION
	DL*	Da*	Dp*	DE*	CMC					RED	YEL	GRN	BLU	LIGHT	DARK		GRAY	CLEAN	HIGH	LOW		

Production Part Approval Process

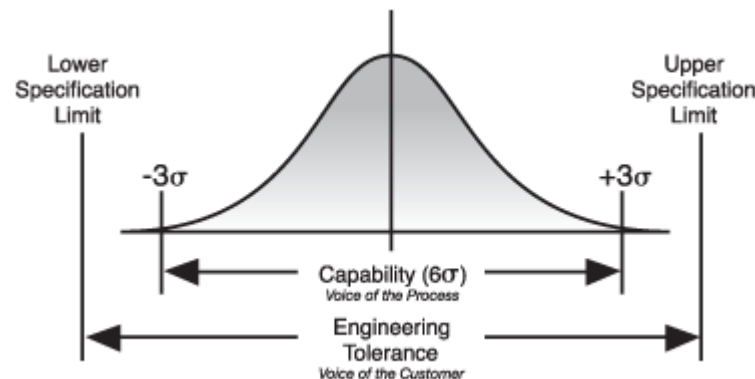
Process capability studies



Description

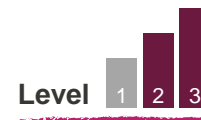
- determine how well the production process can manufacture products that meets the design requirements (stable and capable)
- Short-term investigations for special characteristics according to the drawing
- The number of samples for the initial investigations depends on the supply quantity over one year
See Table 2, WN 50020
(Depending on the PO – QTY, the qty of the parts can be adjusted on a case-by-case decision.)
- Supplier agrees with KION index (Table 3, WN 50020) to be used to determine the initial process capability

Example



➔ May be replaced by long-term results from identical or similar processes (with KION agreement)

Production Part Approval Process Requirements

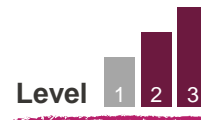


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Production Part Approval Process

Design FMEA



Description

- If supplier is responsible for the design
- **Design Failure Mode and Effects Analysis:**
 - Provide potential cause
 - Evaluate Risk Priority Number (RPN) of failures
 - Define corrective and preventive actions (Re-design, DVP&R...)
- Consider functions from product or system
- An individual Design FMEA may be applied to a family of similar individual parts

KION Form

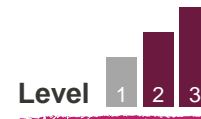
Failure Mode and Effects Analysis													KION		
System/element: Process name Design: Controller Operation: Machine Reason for change: Machine in charge Reason for change: 100% components Location: Ulfshale, Schmidt, Meyer Management:															
Designed by: Christoforus Threlt, vsp Date prepared: 07.09.2018 Drawn: J. J. J. J. J. Checked: J. J. J. J. J. Approved: J. J. J. J. J.															
No.	Component / Function / Process	Potential failure mode The effect is below the specification	Potential effects of failure Operational function	Potential failure causes Input signal is applied incorrectly	Current process controls Constructive implementation of the system	Safety	Occurrence	Detection	RPN	Responsible Action Responsible	Responsible Target date	Rating	Occurrence	Detection	RPN
1	Reading function				M: Release testing	5	5	7	125						
										M: verify while substitution substitution	07.09.2018	5	5	7	125
										M: while constructive implementation double check		5	5	7	125
										M:		5	5	7	125
										M:		5	5	7	125
										M:		5	5	7	125
										M:		5	5	7	125

Severity	X	Occurrence	X	Detection	=	RPN
5		4		2		40

➔ To be submitted before design freeze

Production Part Approval Process

Testing equipment



Description

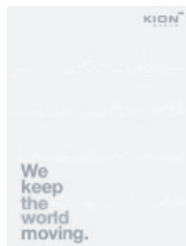
- If required by KION, the supplier shall submit the part-specific testing equipment for assemblies or components as part of the PPAP submission
- The supplier must certify that the testing equipment meets the part's dimensional and functional requirements
- The supplier shall schedule preventative maintenance for all testing equipment during the entire production period

Example



Production Part Approval Process Navigation

- » What's PPAP?
- meaning
- origin



» Benefits & Targets

Improve quality cooperation
Zero failure target Increase customer satisfaction
confidence in future product
Risk reduction **Benefits** Part view + Process view
design integrity
Reduce warranty charges smooth SOP managing supplier changes
standardization Prevents costs for poor quality
Global approach

» What has changed?



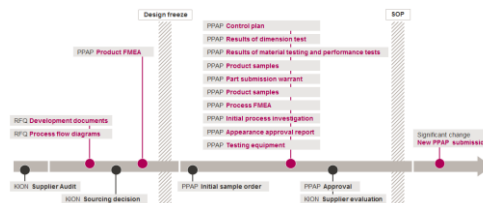
» PPAP Level



» PPAP Content

15 different requirements including example

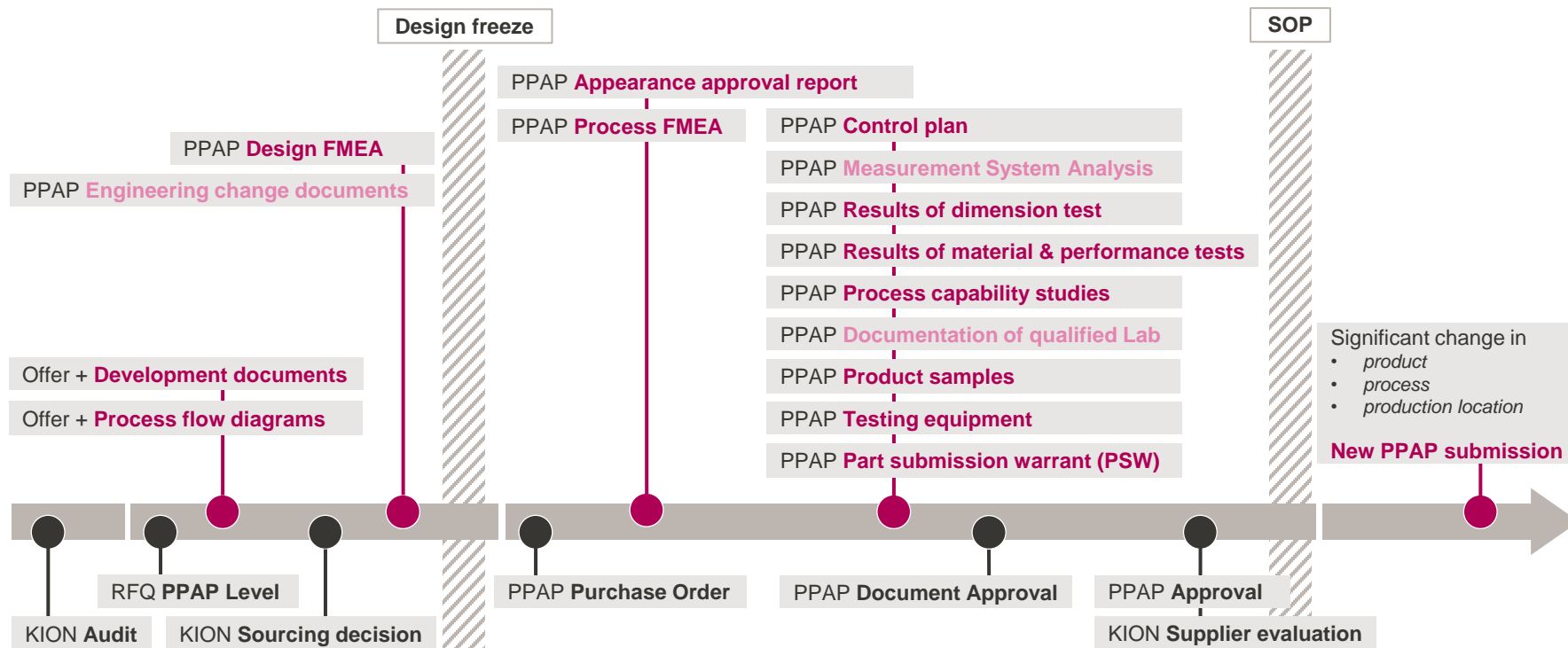
» PPAP Timeline



» Additional information

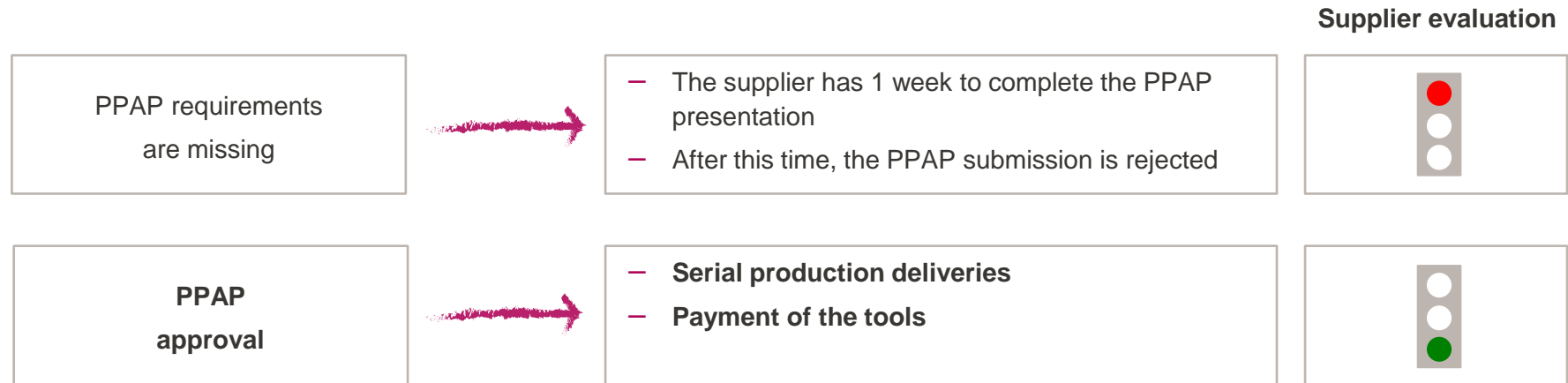
- KION standard
- PPAP website
- contact

Production Part Approval Process Timeline



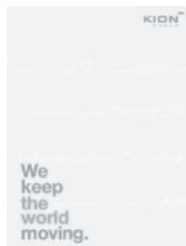
Production Part Approval Process

PPAP status consequences



Production Part Approval Process Navigation

- » What's PPAP?
- meaning
- origin



» Benefits & Targets

Improve quality cooperation
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Global approach

» What has changed?



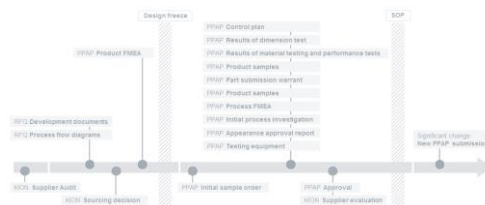
» PPAP Level



» PPAP Content

15 different requirements including example

» PPAP Timeline



» Additional information

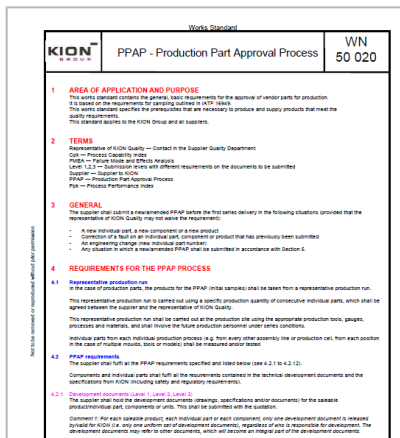
- KION standard
- PPAP website
- contact

Production Part Approval Process

Additional Information

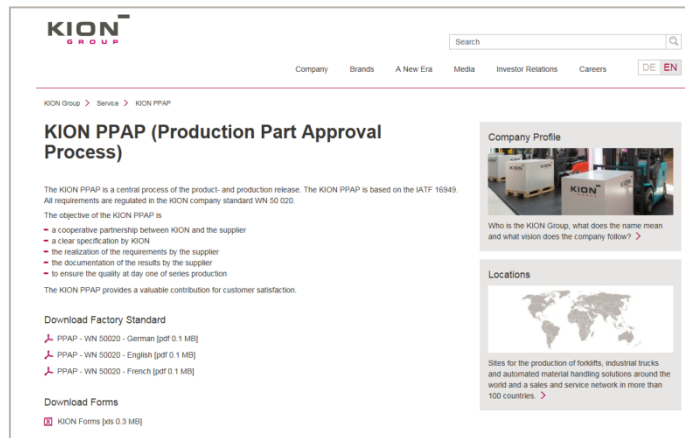
» KION Standard

– WN 50020



» Website

– KION PPAP website



» Contact

– Email/ Phone

Please contact the
Quality@Supplier representative
for specific questions.

In case of the representative is
not known, ask the buyer.

<https://www.kiongroup.com/en/About-us/Suppliers/>

Dematic Supplier Portal (only in case supplier delivers PPAP to Dematic)

