Internal Production Part Approval Process (PPAP)

Guidance Manual

SQM03

Revision: B

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1.0 Purpose

To provide detailed instruction for the flow down and review of the Production Part Approval Process (PPAP).

The purpose of this document is:

- ✓ To provide the evidence that all JELD-WEN Engineering design record and specifications requirements are understood and fulfilled by the Suppliers manufacturing organization.
- ✓ To demonstrate that the Supplier's manufacturing process has the potential to produce a product that consistently meets all JELD-WEN requirements during an actual production run.

2.0 Scope

This document communicates JELD-WEN's requirements concerning the PPAP process. This document will encompass guidance for reviewing and approving Supplier PPAP submissions.

*Note that the PPAP process is not only for Suppliers, it is a good practice to execute PPAP requirements to internal product and process changes.

3.0 Reference Documents

3.1 SQM01 Supplier Quality Requirements Manual

3.2 SQM02 Supplier Production Part Approval Process Manual

3.3 APQP: Advanced Product Quality Planning and Control Plan, 2nd Edition

3.4 FMEA-4: Potential Failure Mode & Effects Analysis Manual, 4th Edition

3.5 PPAP-4: PPAP Production Part Approval Process (PPAP) Manual, 4th Edition

4.6 MSA-4: Measurement Systems Analysis, MSA-4

4.0 General

As one of the world's leading manufacturers of reliable windows and doors, JELD-WEN has selected the PPAP process to ensure a successful partnership with our Suppliers. It's through the PPAP process that JELD-WEN ensures that there is a clear understanding of the product requirements so that they are deployed throughout the Supplier's process. The goal is to mitigate any unknown risks that could impede the Suppliers ability to deliver a quality product on time.

Note: that the PPAP process is not just for Suppliers. The PPAP process can be deployed internally for any new Product, Product change, or process changes.

5.0 Product Requirements

The fundamental purpose of PPAP is to ensure Production parts meet JELD-WEN's requirements. Per the PPAP Manual "*Production Parts shall meet all customer engineering design record and specification requirements (including safety, appearance and regulatory)".* This is the fundamental core reason why PPAP is conducted. This is the reason, why it is critical that all requirements have been identified and that the design records (drawings/specifications) include the requirements. The design records must reflect exactly what JELD-WEN expects to receive from any supplier supplying that part.

6.0 First Article Inspection (FAI) vs. Production Part Approval Process (PPAP)

Why a PPAP versus a First Article:

- An FAI gives only provides confidence regarding the sample that was used to generate the FAI, it is not an indicator of what will be received when production starts.
- PPAP, in addition to FAI, gives confidence that in the future the supplier can provide a consistent quality product that meets JELD-WEN requirements.

7.0 PPAP Requirement

The Production Part Approval Process (PPAP) is a standardized process that helps manufacturers (JELD-WEN) and suppliers communicate and approve production designs and processes before, during, and after manufacture.

JELD-WEN requires a PPAP submission when any of the following occur:

- New part or product
- New supplier
- New process, or technology
- Change to existing product/ material or component
- Change to design including material, construction, or component.
- New, additional, or modified tools
- Upgrade of existing tools
- Tooling, production, or equipment transferred to a different site
- Tooling has been inactive for 12 months
- Product or process changes on the components of the product
- Change in test or inspection method
- Bulk material: New source of raw material
- Change in product appearance attributes
- Change of sub-Supplier or material source

NOTE: Please note that all PPAP submissions including supporting records must be in English.

7.1 PPAP Format Requirement

The Supplier may use their documentation formats so long as they meet the requirements identified by JELD-WEN. Examples of common formats: DFMEA, pFEMA, and Control Plan formats, etc.

8.0 PPAP Submission Levels

The project team is to decide the level of PPAP required from the supplier. The table below provides guidelines to assist with determining what PPAP level should be requested. The team should also consider the Risk involved to ensure that the correct PPAP level is being requested.

JELD-WEN PPAP Levels		
Level	**Submission requirements**	**Application guidelines**
1	Warrant only submitted to the customer	Non-critical parts, Raw or Bulk material, Catalog items, non-critical changes of existing parts previously approved by JELD-WEN at level 3, 4, or 5.
2	Warrant with product samples and limiting supporting data.	Critical bulk product and simple changes. Simple material, revision level only changes, or simple print updates not affecting form-fit-function. May be applied to low and medium-risk parts within a product family.
3	Warrant with product samples and complete supporting data.	New parts, New Supplier, Critical Parts, New Manufacturing location, New Manufacturing Method/Equipment.
4	Warrant and other requirements as defined by JELD-WEN.	Special situations. *JELD-WEN to define the individual requirements.
5	Warrant with product samples and complete supporting data reviewed at supplier's manufacturing location.	Critical Parts requiring onsite review.

8.1 Part/Material Risk

Risk is the probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action.

A wide range of business-critical risks faces today's suppliers. Typical risks include material shortages, catastrophic property losses, supply chain interruptions, IT failures, and more. The lack of transparency and control among sub-suppliers adds to their risk equation. Smart planning is imperative, especially as the globalization of supply processes increases. If executed correctly, the PPAP process will help mitigate these risks.

When determining if a PPAP is needed, the Risk and criticality of the part or parts in question should be examined. The decision to require a PPAP, what level of PPAP or what PPAP elements may be determined based on Risk, such as:

- The riskiest parts require higher levels of PPAP
- Low-risk parts may require less
- Industry Standard Parts (catalog, off-shelf) may require nothing

8.2 Risk Matrix

A risk matrix may be used during risk assessments to help define the PPAP level by considering the probability or likelihood against the consequence severity. This is a simple mechanism to increase the visibility of risks and assist in decision-making.

- High: PPAP Level 3 or 5
- Med: PPAP Level 4
- Low: PPAP Level 1 or 2

Business Risk		**Risk Likelihood**		
Risk Classification		**High:** Sole source, Not financially stable	**Med:** Offshore supplier, Other sources available, Financially stable	**Low:** Other sources available, Financially stable
		10	**5**	**1**
		Calculation: (Business impact # x Risk #)		
High: No other source - supply chain disruption,	**10**	100	50	10
Medium: Negligible, May impact site performance (Delivery)	**5**	50	25	5
Low: No / minimal supply chain disruption	**1**	10	5	1

Quality Risk		**Probability No Detection**		
Risk Classification		**High** Absolute Uncertainty. The product is not inspected or the defect caused by failures is not detectable	**Med** Remote Product is sampled, inspected based on AQL plans	**Low** Product is 100% inspected/tested, defects would be detected
		10	**5**	**1**
		Calculation: (Risk Classification # x Risk #)		
Critical: Used in tested products that have a Potential for causing or resulting in hazardous or unsafe conditions, including injury or death.	**10**	100	50	10
Medium May result in failures, reduction in product's usability	**5**	50	25	5
Low No potential for user injury or product failure.	**1**	10	5	1

8.3 Family PPAPs

If PPAP is needed on multiple similar part numbers, the JELD-WEN project team may provide the Supplier approval to submit a Family PPAP. Family PPAPs are only allowed when:

- Parts have the same shape in common
- Parts must follow the same manufacturing process method.

PAPP Submission Guideline for Shape vs Family		
Shape/Die/Part Number	**Family**	**AAR**
PSW	*Same shape, different length (must not be noted as critical on drawing)	If the shape is the same but different in color, then a family AAR can be completed. Each color (*if the process or tooling impacts color then it needs to be done per shape).
DFMEA (if supplier design responsible)	*Same shape, different color	
Cpk	Process flow	
Packaging proposal (send in advance before production)	pFMEA	
First Article with bubbled drawings	Control Plan	
Material/Test	GR&R	
Checking Aids	Checking Aids	

8.3.1 Requirements for Family PPAP Submissions

The PPAP should be done on a part selected by JELD-WEN and follow the following guideline.

- The part should be the most complex or has the largest volume
- First Article (dimension evaluations) must be completed for each part number.
- Parts produced from more than one cavity, mold, tool, die or production process (line or cell), a First Article (dimension evaluation) must be completed from parts from each.
- Family PPAP, ***cannot*** be executed if the process lines have different equipment.

9.0 PPAP Process Flow

9.1 PPAP Project Alignment with APQP Outputs

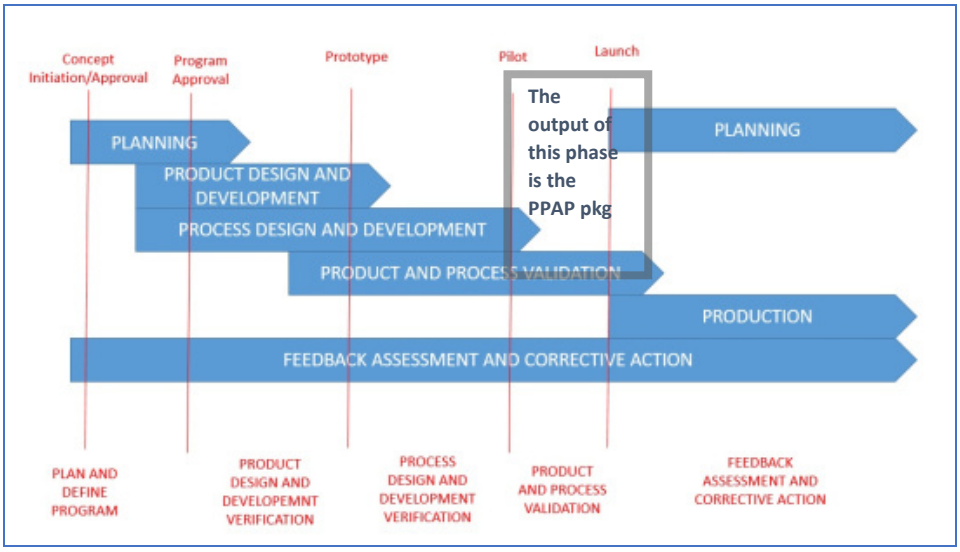
PPAP project tasks align with the Advanced Product Quality Planning process. Reference Advanced Product Quality Planning and Control Plan, 2nd Edition.

The items identified in the table below, are several outputs of different phases in an APQP project, several of them are required elements of the PPAP submittal.

Plan and Define Program	Product Design and Development Verification	Process Design and Development Verification	Product & Process Validation
▪ Design Goals ▪ Reliability & Quality Goals ▪ Preliminary Bill of Materials ▪ Preliminary Process Flow ▪ Preliminary Listing of Special Product & Process Characteristics ▪ Product Assurance Plan	▪ Design FMEA ▪ DFMA ▪ Design Verification ▪ Design Reviews ▪ Prototype Build ▪ Engineering Drawings ▪ Engineering Specifications ▪ Material Specifications ▪ Drawing & Specification Changes ▪ New Equip., Tooling & Facilities Reqmts. ▪ Special Product & Process Characteristics ▪ Prototype Control Plan ▪ Gages/Testing Equip. Requirements	▪ Packaging Standards ▪ Product/Process Quality System Review ▪ Process Flow Chart ▪ Floor Plan Layout ▪ Characteristics Matrix ▪ Process FMEA ▪ Pre-Launch Control Plan ▪ Process Instructions ▪ Measurement Systems Analysis Plan ▪ Preliminary Process Capability Study Plan ▪ Packaging Specifications	▪ Production Trial Run ▪ Measurement Systems Evaluation ▪ Preliminary Process Capability Study ▪ Production Part Approval ▪ Production Validation Testing ▪ Packaging Evaluation ▪ Production Control Plan ▪ Quality Planning Sign-Off

9.2 PPAP Timing

JELD-WEN can request or execute PPAP at any time during the product life to verify that the production process will produce a quality product per JELD-WEN requirements. The PPAP submission is not to be submitted on Prototype parts, as the PPAP must represent actual production conditions. The PPAP requirements must be incorporated into the project plan to ensure that the timelines are not impacted by improper planning of the PPAP. The picture below is an example of a typical project and timing.



9.3 Notification

Notification that PPAP is required needs to be communicated as early as possible, as several of the elements required in PPAP will take time to generate and should be started as early as possible. Remember, most documents are living documents and should be updated as new requirements, changes, and or lessons learned are identified.

9.4 PPAP Team Roles and Responsibilities

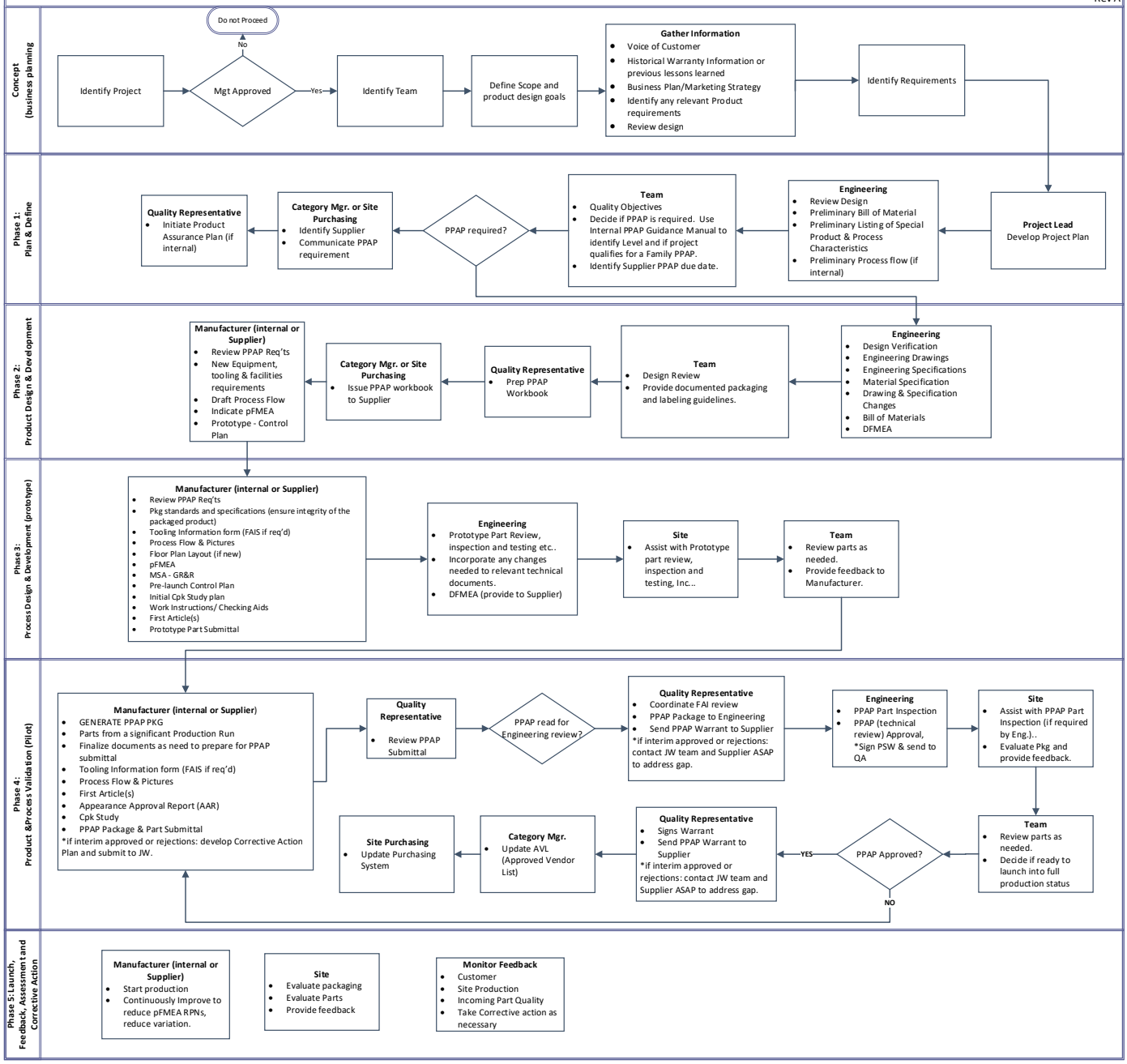
The PPAP process has numerous items that need to be generated or reviewed. Please refer to APPENDIX I – Roles and Responsibilities Table.

9.5 PPAP Process Flow Chart

The flow chart below displays how a typical PPAP Project flow is. This should be used as a guideline and changed as deemed necessary by the assigned team.

PPAP Project Flow

Rev A



9.6 Part Quantity need for PPAP

The PPAP quantity needed depends on how many parts the supplier can run per hour. This is important because the PPAP must represent actual production conditions (not prototype).

PPAP parts must be taken from a significant production run. A minimum of 300 consecutive parts and take a minimum of 1 - 8 hours to produce. This means that if a supplier has a high-volume process in which they can produce 300 parts in under 1 hour, they must produce more parts to meet the 1 – 8-hour production run minimum.

If the Supplier requests a Purchase order to run the number of parts needed to execute the PPAP, JELD-WEN needs to ensure that the correct quantity that exceeds 1 hour of production time is ordered.

NOTE: the parts cannot be used for production until PPAP is approved.

9.7 PPAP Purchase Order

It is not unusual for a Supplier to request a Purchase Order to run the PPAP. This request should be discouraged as we don't want to be liable for parts that do not pass PPAP. If the supplier insists on a Purchase order, the following statement needs to be printed on the Purchase order:

PPAP Level X required

*The PPAP needs to be generated from a production run of 1-8 hours. The PPAP needs to be conducted at the production site with the same manufacturing process (equipment, tooling, gaging, and operators) that will be used to produce this product. The PPAP first article inspection parts (QTY 10) from each cavity need to be properly identified and the package labeled with the PPAP label in the PPAP workbook. The PPAP is to be sent electronically along with PPAP First Article & shipping tracking number to ccopley@jeldwen.com & jwsupplierrequests@jeldwen.com. *PPAP First Article shipping instructions below. Unless otherwise noted, the remaining parts are not to ship until the PPAP has been approved by JELD-WEN via the signed PPAP Warrant or otherwise stated by JELD-WEN. PPAP shipments must be identified as PPAP parts. Note: It is the responsibility of the supplier to immediately contact JELD-WEN if any nonconforming conditions are present in the PPAP documentation (FAI and Cpk studies) before submitting PPAP or shipping any product.*

**PPAP First Article shipping instructions: (xxxxxx)*

Note: lineals exceeding 12 inches in length, need to be cut down to 12-inch samples for PPAP FAI verification.

Reference SQM02: Supplier Part Approval Process (PPAP) Manual. Supplier information page: https://www.jeld-wen.com/en-us/supplier-information

10.0 Elements of a PPAP Submission

The JELD-WEN PPAP submission requirements follow the guidelines outlined within the AIAG Production Part Approval Process (PPAP) Manual, 4th Edition Manual, and APQP Advanced Product Quality Planning and Control Plan, 2nd Edition. The JELD-WEN PPAP specific requirements are identified in the JELD-WEN PPAP Submission Requirements Checklist.

Level 4 PPAPs, will only require the elements identified on the JELD-WEN PPAP Submission Requirements Checklist.

11.0 Instructions for completing the JELD-WEN PPAP Workbook

The JELD-WEN PPAP Workbook consists of a Cover, Master Information Sheet, Instructions FAQ, PPAP Submission Requirements Checklist, and 23 numbered tabs that include forms and/or instruction on elements identified on the JELD-WEN PPAP Submission Requirements Checklist.

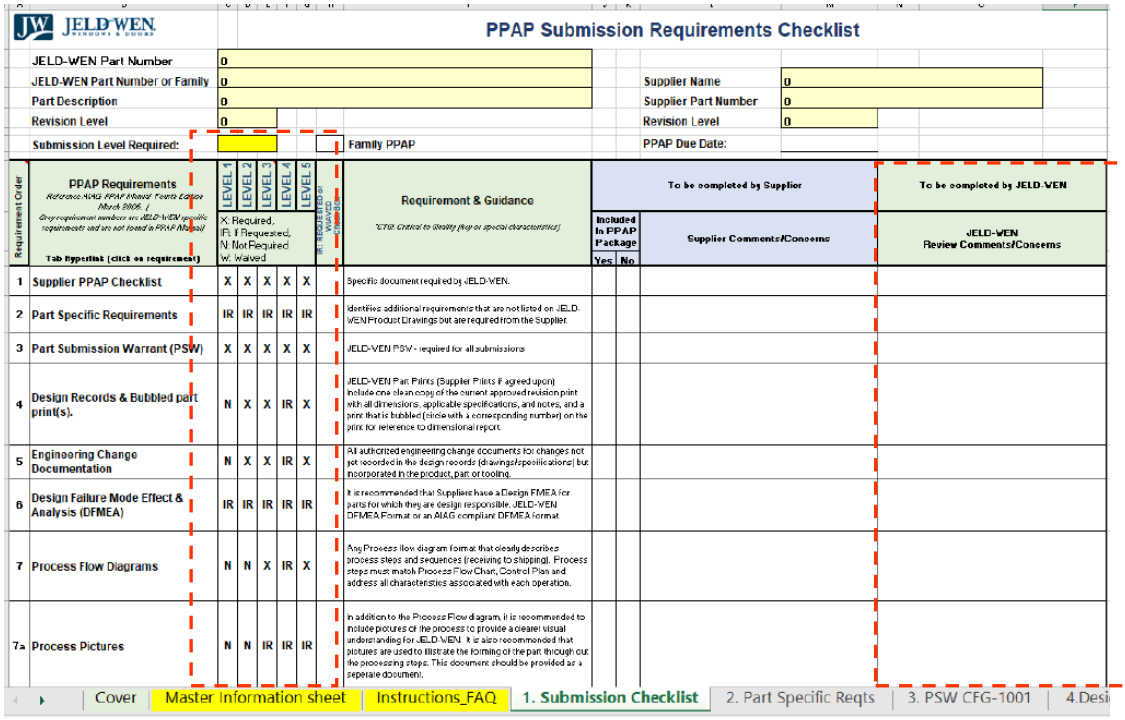
The PPAP submission package must be completed in English and submitted in the order identified in the JELD-WEN PPAP Submission Requirements Checklist and must include the Cover and Master Info sheet and the PPAP Submission Requirements Checklist.

*Note: PPAP should not be done within the workbook as the workbook is only intended to provide guidance and the forms needed. If the PPAP is done within the workbook, it will be extremely difficult to print.

11.1 PPAP Submission Checklist

The level of the required PPAP submission is determined by the JELD-WEN team. The default submission will be level 3 unless specifically notified by JELD-WEN on the PPAP submission checklist. The purpose of the PPAP Submission Checklist is to assist the Supplier and the internal team ensures that all relevant documentation/evidence is submitted. This document will identify the PPAP Level required and if any items are required or waived. The submission checklist is to be included in the PPAP submission package.

The assigned PPAP reviewer is to review the checklist to see what items were required to be submitted. The checklist also includes a comment section to add any comments or identify items that still require additional action. When the PPAP submission is complete, the reviewer is to sign the form once the review is complete.



PPAP Submission Requirements Checklist

JELD-WEN Part Number	0		
JELD-WEN Part Number or Family	0	Supplier Name	0
Part Description	0	Supplier Part Number	0
Revision Level	0	Revision Level	0
Submission Level Required:		Family PPAP	PPAP Due Date:

Requirement Order	PPAP Requirements (Reference AIAG PPAP Manual Fourth Edition March 2006. / Any requirement number on JELD-WEN specific requirements and/or not found in PPAP Manual) Tab Hyperlink (click on requirement)	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	IR Required to Waived	Requirement & Guidance "CTQ: Critical to Quality (key or special characteristics)"	To be completed by Supplier: Included In PPAP Package Yes	No	Supplier Comments/Concerns	To be completed by JELD-WEN: JELD-WEN Review Comments/Concerns
		X: Required, IR: If Requested, N: Not Required W: Waived										
1	Supplier PPAP Checklist	X	X	X	X	X		Specific document required by JELD-WEN.				
2	Part Specific Requirements	IR	IR	IR	IR	IR		Identifies additional requirements that are not listed on JELD-WEN Product Drawings but are required from the Supplier.				
3	Part Submission Warrant (PSW)	X	X	X	X	X		JELD-WEN PSW - required for all submissions				
4	Design Records & Bubbled part print(s).	N	X	X	IR	X		JELD-WEN Part Prints (Supplier Prints if agreed upon) include one clean copy of the current approved revision print with all dimensions, applicable specifications, and notes, and a print that is bubbled (circle with a corresponding number) on the print for reference to dimensional report.				
5	Engineering Change Documentation	N	X	X	IR	X		All authorized engineering change documents for changes not yet recorded in the design records (drawings/specifications) but incorporated in the product, part, or tooling.				
6	Design Failure Mode Effect & Analysis (DFMEA)	IR	IR	IR	IR	IR		It is recommended that Suppliers have a Design FMEA for parts for which they are design responsible. JELD-WEN DFMEA Format or an AIAG compliant DFMEA format				
7	Process Flow Diagrams	N	N	X	IR	X		Any Process flow diagram format that clearly describes process steps and sequences (receiving to shipping). Process steps must match Process Flow Chart, Control Plan and address all characteristics associated with each operation.				
7a	Process Pictures	N	N	IR	IR	IR		In addition to the Process Flow diagram, it is recommended to include pictures of the process to provide a clearer visual understanding for JELD-WEN. It is also recommended that pictures are used to illustrate the forming of the part through out the processing steps. This document should be provided as a seperate document.				

Cover | Master Information sheet | Instructions_FAQ | 1. Submission Checklist | 2. Part Specific Reqts | 3. PSW CFG-1001 | 4.Desi

Supplier Packaging Proposal Plan	IR	IR	X	IR	X		Specific document required by JELD-WEN.	
Tooling Information Form	N	IR	IR	IR	IR		Specific document required by JELD-WEN. Only required when JELD-WEN Owns the tooling.	
First Article Sample Identification Label	N	X	X	IR	IR		Specific document required by JELD-WEN. This Label must be placed on each shipping package/container of FAI samples sent to JELD-WEN.	
Deviation Request Form (DR)	IR	IR	IR	IR	IR		Required only if Supplier is requesting to deviate from a defined requirement. Specific document required by JELD-WEN. Used for any requirement that is non-conforming and requires review by JELD-WEN to provide for approval of the PPAP submission. The supplier must provide a recommended action plan for any issue identified on the Specification Deviation Form.	
Engineering Change Request Form (ECR)	IR	IR	IR	IR	IR		Required only if the Supplier is requesting an Engineering Change. JELD-WEN form to be used by the Supplier to request that JELD-WEN prints, specifications etc. be revised (changed).	
Supplier Corrective Action Report (SCAR)	IR	IR	IR	IR	IR		A SCAR is to be completed whenever there is an issue /nonconformance or as requested by JELD0WEN. W	

Please review the checklist and ensure that all equired items are ready to be submitted and are included in the PPAP Package.

Please review the submitted items and comment on an items that need to be addressed.

Supplier Review conducted by (Name and Title) | ***Date*** | **JELD-WEN Review conducted by (Name and Title)** | **Date**

11.2 Master Information Sheet

Information that is used throughout the workbook can be entered into this sheet. The workbook contains formulas that will automatically pull this information to certain fields. This sheet only requires JELD-WEN personnel to ensure that the information is accurate as it will be disbursed throughout the forms included in the workbook.

11.3 Instructions & FAQ

This tab is for information purposes only. The intent is to assist with questions that may arise regarding the PPAP process. If you have questions that have not been answered in this tab, please e-mail ccopley@jeldwen.com

11.4 Submission Checklist

The PPAP Submission Checklist defines the requirements needed for the PPAP. Please note the “Requirements Order”. The PPAP Package documents must be organized in the order identified in the PPAP Submission Checklist.

> **Please note, the package needs to be generated outside of the workbook. The workbook is only meant to provide guidance and the forms needed for submission*.

11.5 Part Specific Requirements

This form is intended to identify additional requirements that are not listed on JELD-WEN Product Drawings but are required by JELD-WEN. This form is only a temporary form of communication until the product drawings are updated.

11.6 Part Submission Warrant (PSW)

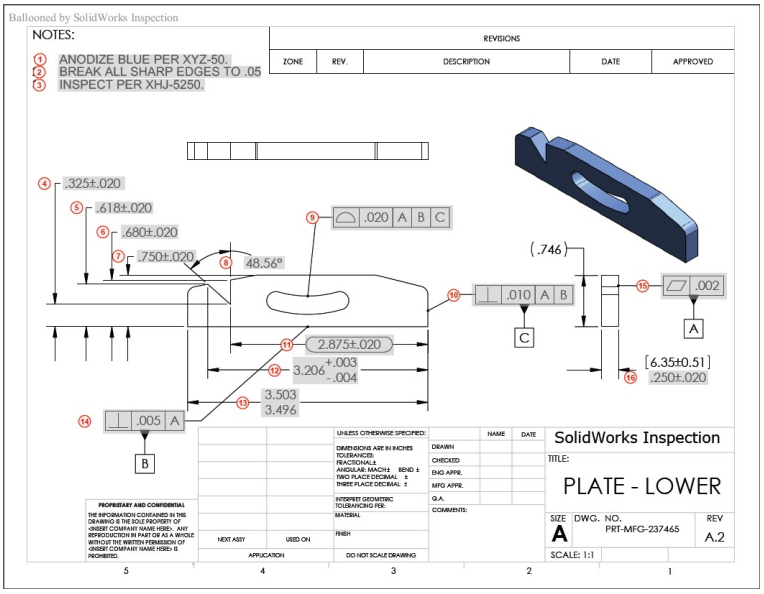
A PSW is a form that will formally document the PPAP disposition. The PPAP reviewer is to approve or reject the PPAP, sign and date the PSW. A copy of the dispositioned PSW is to be sent to the Supplier. The approved (signed) PSW is the official record for production approval. See appendix II.

11.7 Design Records & Ballooned Part Drawing

Two copies of the Design Records (drawing) for the PPAP submission must be included. One must be a clean copy and the other is to be bubbled (circled with a corresponding number assigned to a dimension on the drawing).

The ballooned drawing is to be used when completing the First Article Inspection report. A ballooned drawing shows the parts or assemblies in a part print with numbered "balloons" that point to individual dimensions and requirements of the part. The numbers on the ballooned drawing correlate with the numbers found on the FAI Dimensional Data Sheet in the PPAP forms kit. A ballooned drawing must be submitted as part of PPAP for every submission level when there are dimensional results.

Example:



11.8 Engineering Change Documentation

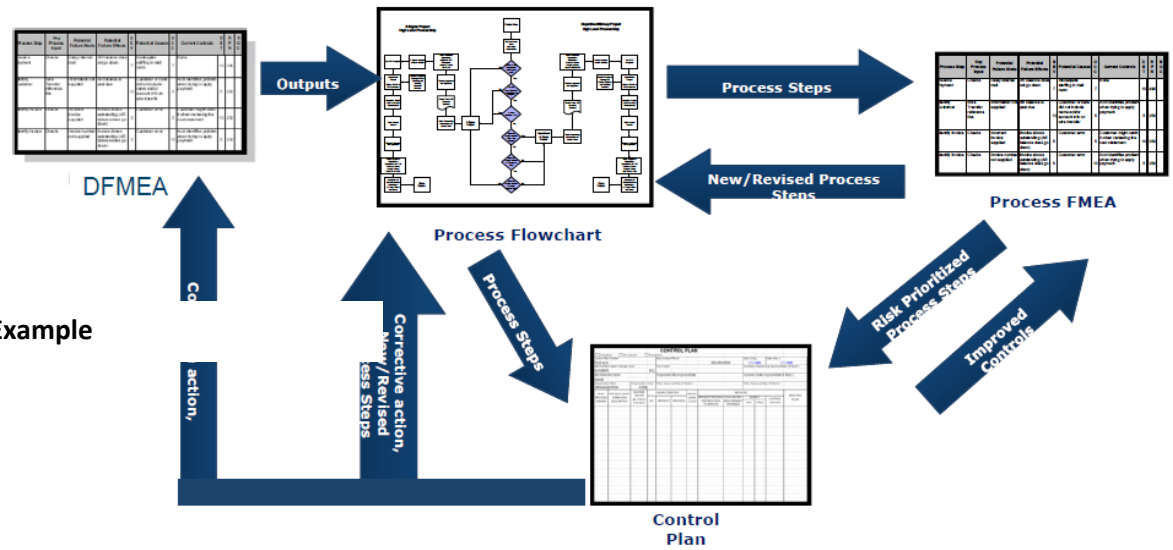
The PPAP package must include all authorized engineering change documents for changes not yet recorded in the design records (drawings/specifications) but incorporated in the product, part, or tooling. This can include a JELD-WEN approved Deviation Request Form (DR) or approved Redlines.

Deviation Requests (DR)s should be generated by the Supplier when a nonconformance or failure to meet a requirement condition is presented. The DR is to be approved or disapproved by Engineering. The DR is only to be used to authorize the shipment of parts based on a Purchase order, QTY, or Time. If this will require a change to the Drawings, the change is to be incorporated.

11.9 Living Document Linkage

The DFMEA, Process Flow Diagram, pFMEA, and Control Plan should be linked. They are NOT standalone documents. Each major process step in the process flow diagram should correlate with DFMEA, pFMEA steps, and documented control plan actions. When one document is changed, all the documents (DFMEA, Process Flow, pFMEA, or Control Plan) need to be reviewed and updated as necessary.

Example



11.10 Design Failure Mode Effect & Analysis (DFMEA)

It is highly recommended that personnel that will be generating or reviewing FMEA's obtain a copy of the AIAG Potential Failure Mode & Effects Analysis (FMEA) Manual. Manuals can be purchased on the AIAG Publication website at: https://www.aiag.org/store/publications/details?ProductCode=FMEA-4

11.10.1 Supplier Design Responsible

If the Supplier is design-responsible, it is highly recommended that a Design FMEA is developed. DFMEA's maybe be generated and applied to "families" of parts. A DFMEA is a living document and needs to be reviewed whenever there is a product or process change and updated as required.

11.10.2 JELD-WEN Design Responsible

If JELD-WEN is design responsible the DFMEA requirement is to be waived for the Supplier. However, a copy of the JELD-WEN product DFMEA should be shared with the supplier to ensure that all potential risks are considered when the Supplier is developing their process and in generating their pFMEA.

11.11 Process Flow Diagrams

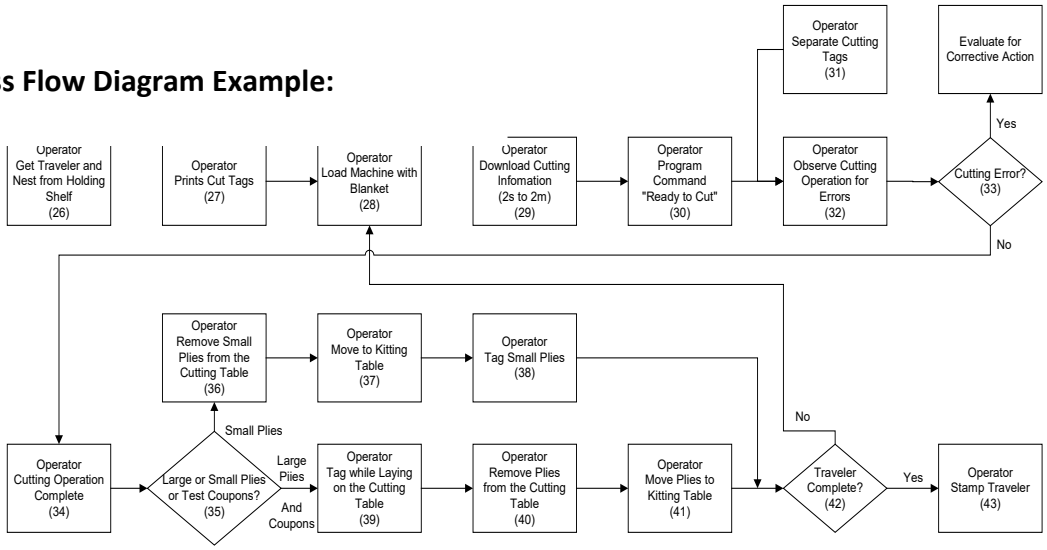
The Supplier must have a process flow diagram in a format that clearly describes the entire manufacturing process (steps & sequences), receiving through shipping. JELD-WEN requirements need to be taken into consideration when developing the process flow diagram. pFMEA's can be generated and applied to "families" of parts. The primary process steps must match both the PFMEA and the Control Plan. The process flow diagram is a living document and must be updated as the process changes.

11.11.1 Process Flow Diagrams must:

- Include JELD-WEN specific requirements
- Include any identified special/critical characteristics
- Include all phases of the process such as:
  - Receiving
  - Storage/ material handling
  - Manufacturing
  - Offline inspections and checks
  - Assembly
  - Testing
  - Packaging
  - Shipping
  - Transportation

    (if any special requirements are identified for transportation).
- Need to include quality handling processes such as:
  - Control of Nonconforming material
  - Scrap
  - Rework

Process Flow Diagram Example:



11.11.2 When should Process Flows be Generated?

As early as possible. The earlier the process flow is generated, the earlier the Supplier and JELD-WEN can understand what equipment, tooling, gauges, or processes are needed. Remember, it's a living document so it can be changed as the process is enhanced.

11.12 Process Pictures

If required, the supplier is to provide pictures illustrating the manufacturing of the part throughout the processing steps. The intent is to provide a clearer visual understanding for JELD-WEN. If required, this document should be provided as a separate document.

11.13 Process Potential Failure Mode and Effects Analysis (pFMEA)

It is highly recommended that personnel that will be generating or reviewing FMEA's obtain a copy of the AIAG Potential Failure Mode & Effects Analysis (FMEA) Manual. Manuals can be purchased on the AIAG Publication website at: https://www.aiag.org/store/publications/details?ProductCode=FMEA-4

11.13.1 Reviewing a pFMEA:

a) pFMEAs need to be consistent with the information in the process flow diagram. All the process steps identified in the process flow are on the pFMEA.

b) Ensure that any potential failure mode and effects have not been missed. Identification of product effects from the DFMEA need to be included.

c) Ensure that JELD-WEN specific requirements are properly accounted for within the pFMEA.

d) Ensure that any CI dimensions are on the pFMEA

e) All RPNs higher than 150 have identified Actions.
When calculating the Risk Priority Number (RPN) for the PFMEA the following rating mechanism should be utilized to assess Severity,

Occurrence, and Detection: (Severity x Occurrence x Detection = RPN).

JELD-WEN WINDOWS & DOORS

POTENTIAL FAILURE MODE AND EFFECTS ANALYSIS (PROCESS FMEA)

Item: 0 FMEA Number:

Product Line: 0 Process Responsibility: Prepared By:

Core Team: FMEA DATE (Orig) (REV)

Process step# / Function		Requirement	Potential Failure Mode	Potential Effect(s) of Failure	Severity	Classification	Potential Causes(s) of Failure	Current Process					Recommended Action	Responsibility & Target Completion date		Action Results				
								Current PROCESS Controls - Prevention -	Occurrence	Current PROCESS Controls - Detection -	Detection	RPN		Responsibility	Due Date	Actions Taken & Completion Date	Severity	Occurrence	Detection	RPN
Process step #	What is the product design specification under consideration?	Enter the requirement for each function.	What is the product design specification under consideration?	In what ways could the product design specification fail to be fully met?	How severe is the effect to the customer?		What could cause the failure mode to occur?	What methods, tools, or measures will discover the cause before design release?	What is the likelihood that the cause will occur?	What methods, tools, or measures will discover the cause before design release?	How difficult is it to detect the cause or mode?	Risk Priority Number (SEV X OCC X DET)	What are the actions for reducing the occurrence of the cause or improving detection? (Should have actions only on high RPNs or easy fixes.)	Who is responsible for the recommended action?	How difficult is it to detect the cause of failure mode?	What were the completed actions taken and the recalculated RPN? (Be sure to include completion month/year.)	How severe is the effect to the customer?	What is the likelihood that the cause will occur?	How difficult is it to detect the cause of failure mode?	Risk Priority Number (SEV X OCC X DET)

11.13.2 Severity:

An assessment of how serious the Failure Effect (due to the Failure Mode) is to the customer. Severity is a relative ranking within the scope of the FMEA. The table below is only to provide guidance. The team should agree on evaluation criteria and a ranking system and apply them consistently.

Effect	Criteria: Severity of Effect Defined	Ranking
Hazardous: Without Warning	May endanger operator. Failure mode affects safe vehicle operation and / or involves noncompliance with government regulation. Failure will occur **WITHOUT** warning.	10
Hazardous: With Warning	May endanger operator. Failure mode affects safe vehicle operation and / or involves noncompliance with government regulation. Failure will occur **WITH** warning.	9
Very High	Major disruption to production line. 100% of product may have to be scrapped. Vehicle / item inoperable, loss of primary function. Customer very dissatisfied.	8
High	Minor disruption to production line. Product may have to be sorted and a portion (less than 100%) scrapped. Vehicle operable, but at a reduced level of performance. Customer dissatisfied.	7
Moderate	Minor disruption to production line. A portion (less than 100%) may have to be scrapped (no sorting). Vehicle / item operable, but some comfort / convenience item(s) inoperable. Customers experience discomfort.	6
Low	Minor disruption to production line. 100% of product may have to be reworked. Vehicle / item operable, but some comfort / convenience item(s) operable at reduced level of performance. Customer experiences some dissatisfaction.	5
Very Low	Minor disruption to production line. The product may have to be sorted and a portion (less than 100%) reworked. Fit / finish / squeak / rattle item does not conform. Defect noticed by most customers.	4
Minor	Minor disruption to production line. A portion (less than 100%) of the product may have to be reworked on-line but out-of-station. Fit / finish / squeak / rattle item does not conform. Defect noticed by average customers.	3
Very Minor	Minor disruption to production line. A portion (less than 100%) of the product may have to be reworked on-line but in-station. Fit / finish / squeak / rattle item does not conform. Defect noticed by discriminating customers.	2
None	No effect.	1

11.13.3 Occurrence:

An assessment of the likelihood that a cause will happen and result in the Failure Mode. The table below is only to provide guidance. The team should agree on evaluation criteria and a ranking system and apply them consistently.

Probability of Failure	Possible Failure Rates	Cpk	Ranking
Very High:	≥ 1 in 2	< 0.33	10
Failure is almost inevitable	1 in 3	≥ 0.33	9
High: Generally associated with processes similar to previous	1 in 8	≥ 0.51	8
processes that have often failed	1 in 20	≥ 0.67	7
Moderate: Generally associated with processes similar to	1 in 80	≥ 0.83	6
previous processes which have	1 in 400	≥ 1.00	5
experienced occasional failures, but not in major proportions	1 in 2,000	≥ 1.17	4
Low: Isolated failures associated with similar processes	1 in 15,000	≥ 1.33	3
Very Low: Only isolated failures associated with almost identical processes	1 in 150,000	≥ 1.5	2
Remote: Failure is unlikely. No failures ever associated with almost identical processes	≤ 1 in 1,500,000	≥ 1.67	1

11.13.4 Detection

An assessment of the likelihood that the current controls will detect the cause of the Failure Mode or the Failure Mode itself, should it occur, thus PREVENTING the Failure Effect from reaching your customer. The customer in this case could be the next operation, subsequent operations, or the end-user. The table below is only to provide guidance. The team should agree on evaluation criteria and a ranking system and apply them consistently.

Detection	Criteria	Inspection Types			Detection Methods	Rank
		A	B	C		
Almost Impossible	Absolute certainty of non-detection				Cannot detect, or is not checked.	10
Very Remote	Controls will probably not detect			X	Control is achieved with indirect or random checks only.	9
Remote	Controls have poor chance of detection			X	Control is achieved with visual inspection only.	8
Very Low	Controls have poor chance of detection			X	Control is achieved with double visual inspection only.	7
Low	Controls may detect		X	X	Control is achieved with charting methods such as Statistical Process Control (SPC).	6
Moderate	Controls may detect		X		Control is based on variable gaging after parts have left the station or go/no-go gaging performed on 100% of the parts after they have left the station.	5
Moderately High	Controls have a good chance to detect	X	X		Error detection in subsequent operations OR gauging performed on setup and first piece check (for setup causes only).	4
High	Controls have a good chance to detect	X	X		Error detection in-station or error detection in subsequent operations by multiple layers of acceptance: supply, select, install, verify. Cannot accept discrepant part.	3
Very High	Controls almost certain to detect	X	X		Error detection in-station (automatic gauging with automatic stop feature). Cannot pass discrepant part..	2
	Controls certain to of detect	X			Discrepant parts cannot be made because item has been error proofed by process/product design.	1
Inspection Types:	A) Error-proofed					
	B) Gauging					
	C) Manual Inspection					

11.13.5 RPN

Risk Priority Numbers (RPN) method is used to assess risk on the pFMEA. The pFMEA must:

- Rate the **severity** of each effect of failure.
- Rate the likelihood of **occurrence** for each cause of failure.
- Rate the likelihood of prior **detection** for each cause of failure (*i.e.* the likelihood of detecting the problem before it reaches the end-user or customer).
- Calculate the RPN by obtaining the product of the three ratings:

  - ❖ **RPN = Severity x Occurrence x Detection**
    The RPN is to be used to compare issues within the analysis and to prioritize problems for corrective action. The top 5 RPN items need to have corrective actions.

11.14 Control Plan

All processes must have a control plan that defines all methods used for process control and complies with JELD-WEN specified requirements. The control plan must clearly state each step in the process; the specification and all CI characteristics must be addressed for product and process. The control plan should address the following:

A. Methods of production

B. Identification of CI characteristics

C. Secondary or Outsourced Operations

D. Materials and their physical and chemical characteristics

E. Types of process equipment at each operation

F. Types of test equipment used to measure each characteristic

G. Specifications, sampling strategy, control, and reaction methods used.

H. Periodic conformance testing and product verification

J. Reaction Plan is appropriate

JELD-WEN WINDOWS & DOORS

CONTROL PLAN

☐ Prototype	☐ Prelaunch	☐ Production	Key Contact:		Date(Orig)	Date (Rev.)
Control Plan Number:						
Part Number/Latest Change Level	0		Core Team		Customer Eng	
Part Name/Description	0		Supplier/Plant Approval/Date		Customer Quality	
Supplier/ Plant 0	Supplier Code:	0	Other Approval/Date (if Req'd)		Other Approval/D	

Part/ Process Number	Process Name/ Operation Description	Characteristics				Special Char Class	Methods					Reaction Plan
		Machine, Device, Jig, Tools, for Mfg.	No.	Product	Process		Product/Process Specification/ Tolerance	Evaluation/ Measurement Technique	Size	Freq.	Control Method	

11.15 Measurement System Analysis Studies, GR&R

JELD-WEN may require that an MSA study be conducted on all measurement equipment that is used to accept or fail the product. This generally covers all measurement tools identified in the control plan.

Measurement System Analysis (MSA) is a mathematical method of determining how much variation within the measurement process contributes to overall process variability. MSA is used to ensure the right measurement equipment is used to qualify production parts or processes. More information on MSA can be found in the AIAG Measurement Systems Analysis, MSA-4 Manual.

The purpose of an MSA is:

1. To determine how much error is in the measurement due to the measurement process itself.
2. Quantifies the variability added by the measurement system.
3. Applicable to attribute data and variable data

11.15.1 A Gauge Repeatability and Reproducibility (GR&R)

A Gauge Repeatability and Reproducibility (GR&R) study is used to ensure that measurements taken in the manufacturing process and reasonably consistent regardless of how many times they are performed or who performed them. It is important to select a sample size that encompasses the full range of parts. The GR&R is the MSA method the JELD-WEN will require as part of the PPAP submission.

11.15.2 Format/Software

The supplier may use any statistical software, IE: Mini-tab, SPC Excel or equivalent to conduct the measurement study.

11.15.3 GR&R guidelines for acceptance:

GR&R TOL %	Acceptance	Action
% Gage R&R is under 10%,	Pass: Gage System is useable. This applies to CIs. Cis must be 10% or less.	No action required
% Gage R&R is between 10 % to 30%	Acceptable: Gage System is useable but marginal	May require corrective action
% Gage R&R is over 30%	Fail – Gage System is unusable	Requires corrective action

If the GR&R Fails, the supplier is required to submit corrective action on how to address the poor GR&R. Once the Corrective action is reviewed and deemed acceptable, the JELD-WEN team may disposition the PPAP to Interim approval.

11.16 First Article (FAI) Dimensional Layout

The Supplier is to submit a First Article for each part number. Dimensional results on 10 parts are to be recorded on the First Article Dimensional Inspection) form. Parts produced from more than one cavity, mold, tool, die or production process (line or cell), a First Article (dimension evaluation) must be completed and submitted to JELD-WEN from parts from each cavity, etc.

The measurements on the form should correlate with the ballooned drawing submitted by the Supplier. The parts used for dimensional data must be from production tooling/process and randomly sampled from a run at production rate. The Project Team is to decide where the FAI parts are to be shipped so that they can be evaluated and verified against the FAI submitted by the Supplier.

The supplier is to promptly notify JELD-WEN if any dimension in the FAI form "Judgment" column failed inspection. JELD-WEN Engineering will review and disposition.

Note: The parts measured to obtain the dimensional results must be the same parts submitted for the PPAP Submission.

11.16.1 FAI Samples

The part submitted as part of the PPAP are to be the actual samples measured in the FAI dimensional analysis. Multi cavity parts must be identified cavity number.

The PPAP samples are to be labeled as PPAP Samples using the First Article Shipping Tab located in the PPAP Workbook. The samples must be identified using this label to avoid the PPAP sample parts being inadvertently misplaced or mixed up with production parts.

11.17 Material, Performance Test Results

The purpose of this item is to ensure that the material is verified for its properties and that acceptable performance is demonstrated. Material Certificates and/or test reports are to be submitted to show conformance to the identified requirements.

11.18 Initial Process Study (Cpk) Capability Studies

The purpose of initial process studies (Cpk) is to determine if the production process is likely to be statistically able to manufacture a product that will meet JELD-WEN requirements and the readiness of the process for production. In simple words, it measures the producer's capability to produce a product within JELD-WEN's tolerance range. Initial process studies (capability) are to be done for all Critical dimensions (CI). JELD-WEN is to select dimensions to conduct the CpK studies if there are no identified CIs on the drawing.

The process capability studies shall be summarized with the following indices:

- Cp – Process Capability: determines the capability of producing to specification.

- CpK - Process Capability Index: same as Cp, but also measures how centered the process is. Cpk is a standard index to state the capability of one process, the higher the Cpk value the better the process is
- Pp – Process Performance:
- PpK – Process Performance Index

11.18.1 Acceptance Criteria for initial study

The capability study is to be performed on samples taken from an actual production run. A Cpk Index ≥ 1.33 indicates that the process is capable and meets specification limits. Unless otherwise defined by JELD-WEN, the minimum acceptance is a Cpk Index ≥ 1.33 for all Critical dimensions (CI's). Any value less than this may mean variation is too wide compared to the specification or the process average is away from the target.

Results	Interpretation
Index > 1.67	The process currently meets the acceptance criteria
1.33 ≤ Index ≤ 1.67	The process is acceptable.
Index < 1.33	The process does not currently meet the acceptance criteria. A corrective action plan must be generated.

Once PPAP is approved, Cpk studies need to be conducted when materials, processes, manufacturing location, or equipment have changed, or material suppliers have changed.

11.18.2 Unstable Processes

An unstable process is an indicator that the process may not meet requirements. This will require that the process be evaluated to identify and wherever possible, eliminate special causes of variation before PPAP submission. If the supplier is unable to obtain a Cpk value of >1.33, the supplier is to submit a corrective action plan and a modified Control Plan with increased inspection. Variation reduction efforts need to continue until the acceptance criteria are met.

11.18.3 Study Format/Software

The supplier may use any statistical software, IE: Mini-tab, SPC Excel, or equivalent to conduct the measurement study.

11.19 Qualified Laboratory Documentation

The purpose of Qualified Laboratory Documentation is to ensure that the testing for PPAP has been done by a qualified lab. If the supplier's organization is performing testing or measurement internally or externally at an outside facility, then proof of scope and accreditation is required.

11.19.1 Internal Labs located at Supplier

All suppliers that have testing or measurement performed on-site must provide the following in this section of the PPAP submission.

Record / Scope that identifies the testing to be done and it must include:

a) List of your personnel's competency and training to perform the testing.

b) List of all test equipment used in process and offline.

c) List of methods and standards used to calibrate the equipment.

11.19.2 External Labs located offsite from the Supplier

If you are sending out for measurement and testing, you must ensure that you use an accredited lab and can provide proof of accreditation. JELD-WEN prefers external labs be accredited to known standards such as ISO 17025, ISO 10012:2004, or ANSI/NCSL Z540-1-1994.

a) Provide a copy of the lab company's Third-Party accreditation.

b) Results must be on company letterhead and include the following:

- The name of the lab
- Date of testing
- Standards used for testing

11.20 Appearance Approval Report (ARR)

AAR typically applies only for parts with color, grain, or surface appearance requirements. The AAR is to be completed to record the required information on the AAR form. The AAR form is an AIAG form March 2006 CFG-1002.

As part of defining the product requirements, the PLM along with Engineering should make sure to define any aesthetic requirements. These requirements need to be documented in either cosmetic, color & gloss specifications and or referenced on the part drawing.

11.21 Master Samples

Master Samples parts retained by the Supplier as part of the PPAP record. The supplier is to retain a master sample for each position of a multiple cavity die, mold, tool or pattern, or production process unless otherwise specified by JELD-WEN. It is also recommended that the parts sent with the FAI are retained by JELD-WEN.

11.22 Checking Aids

The purpose of this item is to provide evidence that the checking aids used to verify the product exist and have been properly validated.

There are many different types of checking aids. Examples of checking aids include but are not limited to certified check fixtures, un-certified check fixtures, templates, custom gauges, and test equipment.

JELD-WEN must ensure that the checking aids are properly validated. The supplier is to submit evidence of the checking aid being validated, this can include but is not limited to First Article Reports or calibration reports.

11.23 Supplier Packaging Proposal Plan

The Supplier Package Proposal Plan is to get an agreement on how the product will be packaged. The intent is to define and agree upon a packaging method that will be used for ongoing deliveries. This plan must be sent before the PPAP submission to ensure the packaging will work for the impacted JELD-WEN facility. Factors to consider: safety, handling, weight, size, durability, quantity per package, labeling. The approved packaging proposal is to be included in the PPAP submission. The impacted sites are responsible to review and approve the supplier's packaging proposal plan.

*It is important that site constraints be considered when reviewing this Plan.

11.24 Tooling Information Form

This form is to be completed only if JELD-WEN owns the tool or if requested by JELD-WEN.

11.25 First Article Sample Identification Label

This label must be used to identify First Article Inspection (FAI) samples sent to JELD-WEN. The label must be placed on each shipping package/container of FAI samples sent to JELD-WEN.

11.26 Deviation Request Form (DR)

This form is to be used by the Supplier for any requirement that is non-conforming and requires review and approval by JELD-WEN before PPAP submission. If approved, the DR must be included in the PPAP submission. The supplier must provide a recommended action plan for any issue identified on the Deviation Request (DR) Form. This form needs to be reviewed and approved by Engineering, Quality, and PLMs as applicable. A copy of the signed DR form is to be sent to the supplier who in turn must attach a copy to any impacted shipments.

11.27 Engineering Change Request Form (ECR)

An ECR is only required only if the Supplier is requesting an Engineering Change. The ECR is to be reviewed and dispositioned by the assigned Product Engineer. See JELD-WEN Notification section in this manual for more guidance.

12.0 PPAP Submission

The PPAP package is to be submitted via email to jwsupplierrequests@jeldwen.com and cc ccopley@jeldwen.com. The PPAP package is considered Technical data and therefore a copy must be controlled and retained by the Supplier & JELD-WEN for life of the product unless otherwise designated.

Note: incomplete submissions will not be accepted and will be immediately rejected.

13.0 Supplier Corrective Action Report (SCAR)

A Supplier Corrective Action Request (SCAR) form is used to notify and request corrective actions from suppliers of quality or service issues. For PPAP, a SCAR is to be generated when a requirement is not met, and an example of a PPAP situation that would warrant a SCAR is Cpk below 1.33. A good SCAR response that outlines a plan on correcting the issue may allow JELD-WEN to provide the PPAP an interim approval.

Suppliers are responsible to verify the effectiveness of the completed Corrective Action and Preventive Action.

Note: Existing suppliers are t have a SCAR issued through the PHRED System.

14.0 Disposition

Upon receipt of the PPAP Package, a JELD-WEN Quality and Engineering Representative will review and disposition the PPAP. PPAP disposition will either be issued an interim approval, rejected, or approved.

14.1 Interim Approval

Interim Approval permits shipment of the material to JELD-WEN on a limited time or piece quantity basis. This does not stop work on the PPAP, the items that caused it not to be approved must be addressed.

14.2 Rejected

PPAP submissions that do not meet requirements will be rejected. The Supplier must correct the submission and/or process, as appropriate to meet JELD-WEN's requirements.

14.3 Approved

The PPAP will be approved it meets all the requirements. Once Approved, the PSW will be signed and returned to the Supplier.

Note: After successful PPAP approval, no change may be made by the supplier to the product or process without written approval from JELD-WEN**.**

15.0 JELD-WEN Notification of Requested or Proposed Changes

Whenever the Supplier is planning a change that affects a part ,or the process making that part, it is the Supplier's responsibility to get approval from JELD-WEN before initiating that change. To request approval for the change, the Supplier must submit an Engineering Change Request (ECR) form. The ECR must be approved by JELD-WEN before implementation. Failure to have an approved ECR may impact future business opportunities.

The purpose of this requirement is to prevent quality & delivery issues resulting from unapproved, untested changes or modifications after PPAP approval. This applies, but is not limited to, the following cases:

- Transferring of the production line: partly or totally; to a new or existing location, plant or building
- New production layout or changes to the production line
- Change of a sub-tier supplier
- Changes of a process at a contract supplier, (surface treatment, machining…..)
- Packaging changes or repackaging operations
- Change at sub-tier suppliers that affect fit, form, or function of the product
- Renewal of non-consumable tooling
- Change to the raw material
- Outsourcing all or part of the production to a sub-tier supplier
- Request for change to product design including dimensions, tolerance, function, appearance

The Supplier is to submit an Engineering Change Request (ECR) to JELD-WEN as soon as the process change, or product modification project is known. Some components or commodities may require a longer time to achieve full approval of the proposed changes. As a rule, suppliers should notify JELD-WEN of required changes as early as possible and obtain an agreement on the implementation timing. Suppliers may be required to submit additional information to support the evaluation of the proposed change (Product Validation Testing, Dimensional or Functional Reports). Upon notification and approval of the proposed change by the authorized JELD-WEN representative, and after change implementation, PPAP submission is required before shipping product unless otherwise specified.

16.0 Records

The Supplier is to retain a copy of the approved PPAP package and sample for the life of the product plus two years. JELD-WEN is to retain a copy of the approved PPAP Submission package and approved PSW in the Supplier PPAP History file in the Quality SharePoint site.

Upon notification of the receipt of the approved warrant, the JELD-WEN Quality & Engineering Representatives signs the original Warrant and forwards the approval to the Supplier. Notification is to be made to the JELD-WEN Buyer.

17.0 Terms & Definitions

AIAG	Automotive Industry Action Group
PPAP	Production Part Approval Process
Cp	Process Capability: determines the capability of producing to specification.
Cpk	Cpk predicts future capability and should be used when developing new parts or revising specifications on a part. Cpk should also be used when materials, processes, manufacturing location, or equipment have changed, or Material suppliers have changed.
CI	Critical dimension
DFMEA	Design Failure Mode Effect & Analysis
DR	Deviation Request Form
ECR	Supplier Request for Engineering Change
FAI	First Article Inspection
FMEA	Failure Mode Effect & Analysis
MSA	Measurement System Analysis (MSA) is a mathematical method of determining how much variation within the measurement process contributes to overall process variability. MSA is used to ensure the right measurement equipment is used to qualify production parts or processes.
pFMEA	Process Potential Failure Mode and Effects Analysis
Process Capability	Comparing actual process performance with process specification limits using measure e.g.: Cpk, CP, Sigma Level and parts defective parts per million
Pp	Process Performance
Ppk	Ppk indicates past performance. Use Ppk when you are a new supplier to JELD-WEN but have already been manufacturing the part which JELD-WEN will purchase.
Risk	Risk is the probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action.

18.0 Revision History

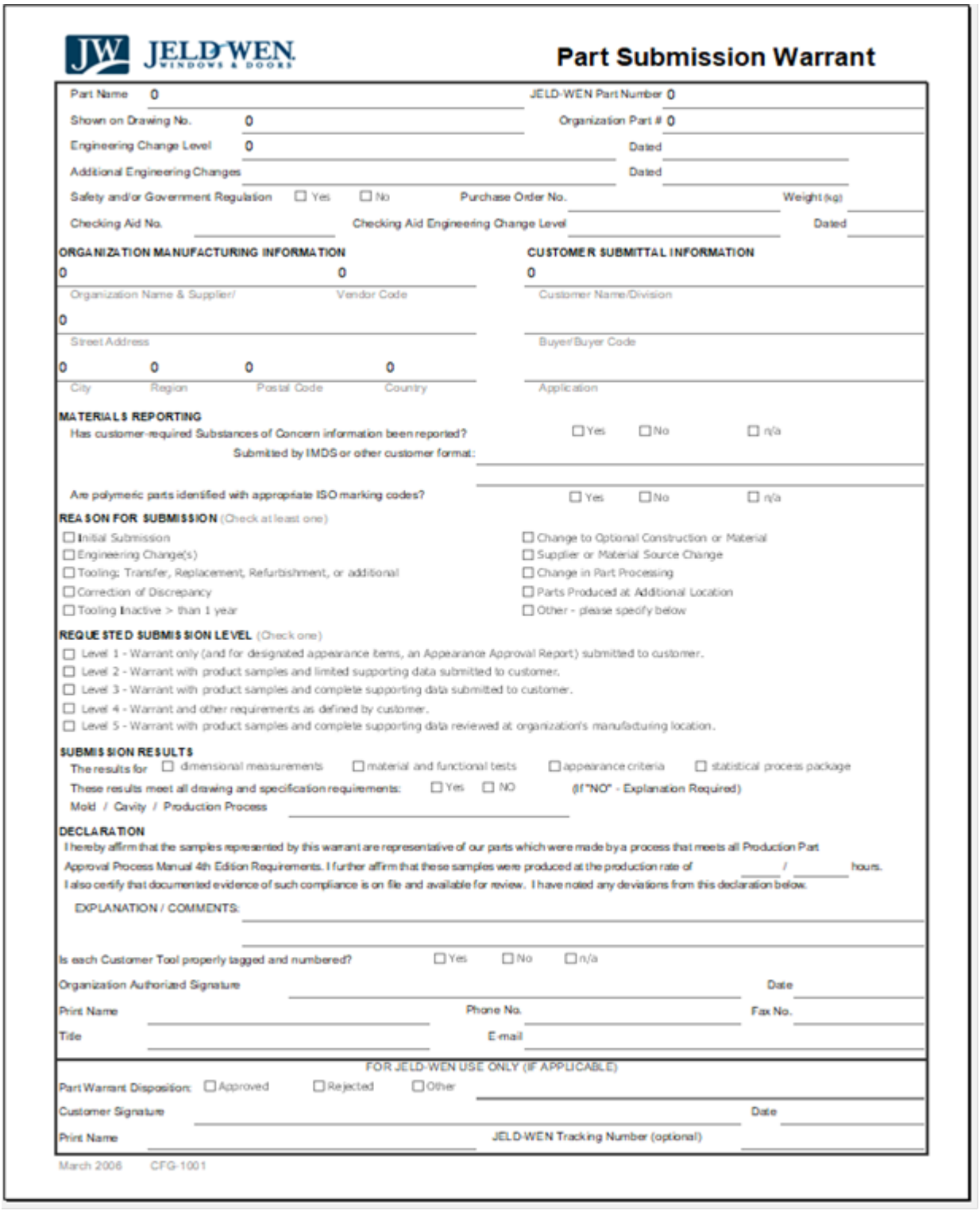
REV	EFFECTIVE DATE	INITIATED BY	DESCRIPTION OF CHANGE
A	4/30/19	Christina Copley	Initial Release
B	10/1/2021	Christina Copley	Updated to add clarification to Family PPAP.

Appendix I – Roles and Responsibilities Table

(This table is only a recommendation. Management and/or Team can assign owners to the specific task)

	Concept (business planning)	Phase 1: Plan & Define	Phase 2: Product Design & Development	Phase 3: Process Design & Development (prototype)	Phase 4: Product &Process Validation (Pilot)	Phase 5: Launch, Feedback, Assessment and Corrective Action
Management	Identify & Approve Project				Approve Launch	
PLM	➢ Voice of Customer ➢ Historical Warranty Information or previous lessons learned ➢ Business Plan/Marketing Strategy	➢ PLM or Project Lead: Define the scope and or product design goals				➢ Monitor Customer Feedback
Engineering	➢ Identify any relevant Product requirements (Aesthetic, AAMA, testing Etc.) *Review design (if existing)	➢ Preliminary Bill of Material ➢ Preliminary Listing of Special Product & Process Characteristics ➢ Preliminary Process flow (if internal)	➢ Design Verification ➢ Engineering Drawings ➢ Engineering Specifications ➢ Material Specification ➢ Drawing & Specification Changes ➢ Bill of Materials ➢ DFMEA	➢ Prototype Part Review, inspection, and testing, etc. ➢ Incorporate any changes needed to relevant technical documents. ➢ DFMEA (provide to Supplier)	➢ PPAP Part Inspection ➢ PPAP (technical review) Approval ➢ Sign PSW and send to QA.	➢ Monitor JW site feedback ➢ Initiate Changes (ECN) needed based on feedback or lessons learned
JW Team (cross-functional team)	➢ Project Kick off ➢ Project Leader: Develop Project Plan with tasks and responsibilities ➢ Assess Design Feasibility	➢ Quality Objectives ➢ Decide if PPAP is required. Use Internal PPAP Guidance Manual to identify Level and if the project qualifies for a Family PPAP. ➢ Identify Supplier PPAP due date.	➢ Design Review	➢ Review parts as needed.	➢ Review parts as needed. ➢ Decide if ready to launch into full production status	
Category Manager		➢ Identify Supplier ➢ Communicate PPAP requirement to Supplier	➢ Prep PPAP Workbook & issue to Supplier.			
Quality Representative Designee		➢ Product Assurance Plan (if internal)		➢ Assist with Prototype Part Review, inspection, and testing, etc.	➢ Coordinate FAI review ➢ PPAP Package review & disposition ➢ Send PPAP Warrant to Supplier **if interim approved or rejections: contact JW team and Supplier ASAP to address the gap.*	➢ Monitor incoming part quality
Manufacturer (can be Supplier or internal)			➢ Review PPAP req'ts ➢ New Equipment, tooling & facilities requirements ➢ Draft Process Flow ➢ Indicate pFMEA ➢ Prototype - Control Plan	➢ Pkg standards and specifications (ensure the integrity of the packaged product) ➢ Tooling Information form (FAIs if req'd) ➢ Process Flow & Pictures ➢ Floor Plan Layout (if new) ➢ pFMEA ➢ MSA - GR&R ➢ Pre-launch Control Plan ➢ Initial Cpk Study plan ➢ Work Instructions/ Checking Aids ➢ First Article(s) ➢ Prototype Part Submittal	❖ **GENERATE PPAP PKG** ➢ Parts from a significant Production Run ➢ Finalize documents as needed to prepare for PPAP submittal ➢ Tooling Information form (FAIs if req'd) ➢ Process Flow & Pictures ➢ First Article(s) ➢ Appearance Approval Report (AAR) ➢ Cpk Study ➢ PPAP Package & Part Submittal **if interim approved or rejections: develop Corrective Action Plan and submit to JW.*	➢ Start production ➢ Continuously Improve to reduce pFMEA RPNs, reduce variation.
JW Site (Stakeholder)			➢ Provide documented packaging and labeling guidelines.	➢ Prototype Part use trial (if required by Eng.)	➢ PPAP Part Inspection (if required by Eng.)	➢ Evaluate packaging ➢ Evaluate Parts ➢ Provide feedback
Site Purchasing		➢ If internal Site project. Communicate PPAP requirements to Supplier.		➢ Cut PPAP run PO (only if required)	➢ Update Purchasing System	➢ Resume regular purchasing activities for this PN or Supplier.

Appendix II - PSW



JELD-WEN WINDOWS & DOORS

Part Submission Warrant

Part Name 0 | JELD-WEN Part Number 0

Shown on Drawing No. 0 | Organization Part # 0

Engineering Change Level 0 | Dated

Additional Engineering Changes | Dated

Safety and/or Government Regulation ☐ Yes ☐ No | Purchase Order No. | Weight (kg)

Checking Aid No. | Checking Aid Engineering Change Level | Dated

ORGANIZATION MANUFACTURING INFORMATION

0 | 0

Organization Name & Supplier/ | Vendor Code

0

Street Address

0 | 0 | 0 | 0

City | Region | Postal Code | Country

CUSTOMER SUBMITTAL INFORMATION

0

Customer Name/Division

Buyer/Buyer Code

Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☐ Yes ☐ No ☐ n/a

Submitted by IMDS or other customer format:

Are polymeric parts identified with appropriate ISO marking codes? ☐ Yes ☐ No ☐ n/a

REASON FOR SUBMISSION (Check at least one)

- ☐ Initial Submission
- ☐ Engineering Change(s)
- ☐ Tooling: Transfer, Replacement, Refurbishment, or additional
- ☐ Correction of Discrepancy
- ☐ Tooling Inactive > than 1 year
- ☐ Change to Optional Construction or Material
- ☐ Supplier or Material Source Change
- ☐ Change in Part Processing
- ☐ Parts Produced at Additional Location
- ☐ Other - please specify below

REQUESTED SUBMISSION LEVEL (Check one)

- ☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
- ☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
- ☐ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
- ☐ Level 4 - Warrant and other requirements as defined by customer.
- ☐ Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.

SUBMISSION RESULTS

The results for ☐ dimensional measurements ☐ material and functional tests ☐ appearance criteria ☐ statistical process package

These results meet all drawing and specification requirements: ☐ Yes ☐ NO (If "NO" - Explanation Required)

Mold / Cavity / Production Process

DECLARATION

I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of / hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from this declaration below.

EXPLANATION / COMMENTS:

Is each Customer Tool properly tagged and numbered? ☐ Yes ☐ No ☐ n/a

Organization Authorized Signature | Date

Print Name | Phone No. | Fax No.

Title | E-mail

FOR JELD-WEN USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other

Customer Signature | Date

Print Name | JELD-WEN Tracking Number (optional)

March 2006 CFG-1001