Jabil Circuit, Inc.
PRODUCTION PART APPROVAL PROCESS
Global Process and Requirements Guidance

1. Purpose

1.1 To define the Jabil Production Part Approval Process for purchased components.

1.1.1 To ensure that supplier can meet the manufacturability and quality requirements for purchased components.

2. Scope

2.1 Suppliers may be requested to provide a Jabil Production Part Approval Process submission may be based on the following, but not limited to:

- Jabil Customer Requirements
- Jabil Site / Business needs
- Jabil Design needs
- Jabil New Product Introduction needs
- Change in material or sub-supplier
- Production following a location change of manufacture.
- This procedure applies when a request for submission has been made to a supplier.

3. Definitions/Terminology

3.1 **JPPAP -** Jabil Production Part Approval Process – A documentation package that is submitted to provide the evidence needed to show that all customer engineering design record and specification requirements are properly understood by the organization and that the designed process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate.

3.1.1 **Other Terms and definitions**

CAPA – (Corrective And Preventive Action) – Method for the investigation and resolution of quality concerns.

NPI – New Product Introduction.

PSW – Product Submission Warrant

DFMEA - Design Failure Mode and Effects Analysis

PFMEA – Process Mode and Effects Analysis

AAR- Appearance Approval Report

FAIR – First Article Inspection Report

DE – Design Engineer

SQE – Supplier Quality Engineer

Control Plan – A document through which a supplier succinctly defines the various means employed to control it's critical and non-critical manufacturing processes as spelled out in its process flow diagram. The Process Control Plan should follow the guidelines identified in the referenced JPPAP template document or an approved equivalent.

Cp-Cpk Studies – A mathematical method of proving that predefined critical manufacturing processes and component features are being maintained by the supplier to Jabil and Customer expectation.

G R&R – Gauge Repeatability and Reproducibility, this is a mathematical method, based on ANOVA (Analysis of Variance), used to determine if a gauging system, employed by a supplier, to measure critical dimensions or features, is robust enough to produce repeatable and reproducible data.

CC´s - Critical Characteristics shall be called out in the drawing by Customer and/or design owner. Otherwise, Customer, Jabil and Supplier need to define if CPK values require to be calculated for some special characteristics based in Form, Fit and Function and its affectation to the performance of the part.

Run at Rate - A term used in the final qualification process which defines the approximate speed or production rate from which a process will be qualified, e.g. have samples taken for inspection purposes, Cp – Cpk studies run.

RFQ – Request For Quote

ROHS - Restricted or Hazardous Substances

IMDS - (International Material Data System) - Also know as Substances Of Concern reporting. When it is required by customer that Jabil provide IMDS for the product delivered, suppliers may submit the required reporting data through the IMDS system. The submission I.D. number may be entered on JPPAP\PSW form under "Materials Reporting". The Jabil IMDS corporate Identification number may be required for submissions, or the customer corporate identification number, depending on agreed method with the customer.

EICC - Electronic Industry Code of Conduct

MSDS - Material Safety Data Sheets

Feasibility Report - A feasibility study/report is an evaluation of a proposal designed to determine the difficulty in carrying out a designated task. For a JPPAP process, a feasibility study/report precedes technical development and project implementation. *In other words, a feasibility*

study/report is an evaluation or analysis of the potential impact of a proposed project and it shall be submitted prior to JPPAP submission.

3.2 HIGH RISK COMPONENTS

- Components from a new technology, new tooling, or new process.
- Custom Products and/or Components.
- Product purchased from a New Supplier.
- Product purchased from a Developmental Supplier or from a Strategic Supplier with documented chronic quality concerns.

3.3 JPPAP SUBMISSION LEVELS

- Level 1: Part Submission Warrant (PSW) only.
- Level 2: PSW with product samples and limited supporting data.
- Level 3: PSW with product samples and complete supporting data.
- Level 4: PSW and other items requested.
- Level 5: PSW with product samples and complete supporting data available for review at the manufacturer.

3.4 DISPOSITION STATUS: DISPOSITION STATUS SHALL BE COMMUNICATED TO THE SUPPLIER UTILIZING THE PART SUBMISSION WARRANT DOCUMENT, PROPERLY SIGNED BY JABIL REPRESENTATIVE.

3.4.1 **FULL QUALIFICATION**; Supplier is authorized to ship as part meets all Jabil specifications and requirements.

3.4.2 **RESTRICTED QUALIFICATION**; this permits shipment of production material for immediate requirements on a limited time or piece quantity basis. Restricted Qualification will be granted only when (1) root cause of the non-conformities preventing Full Qualification is identified and (2) a completed interim action plan is submitted and agreed to by FINAL CUSTOMER/Jabil. Resubmission to obtain Full Qualification is required.

3.4.2.1 A restricted status may also be granted as the result of a partial submission. The signed Part Submission Warrant from Jabil should indicate that the Qualification is gated by the further submission of the outstanding qualification elements.

3.4.3 **REJECTED**; the submission, the production lot from which it was taken, and accompanying documentation do not meet Jabil requirements. Corrected product and documentation must be resubmitted and approved before qualification can be given and production quantities may be shipped.

4. Documents

4.1 Jabil Supplier Requirements Manual – 00-MT60-1000-00605

4.2 Component Supplier Requirements – Contracts and T&C's (T&C's shall be reviewed on a case by case basis depending on customer, Jabil Site, or workcell requirements)

4.3 JPPAP Templates – 00-MT80-1000-00801

4.4 Jabil Workmanship Standard for System Integration – 00-QS60-1000-003

4.5 JDS Component Verification & Validation Procedure 00-DS20-PCQA-004

5. Process

5.1 General Guidelines

PPAP submission, when identified and/or communicated as required, must be completed and approval obtained prior to shipment of the first production lot of material. Approval is obtained through submission to and Jabil acceptance of the requested documentation and samples. Approval shall be communicated in the form of a Jabil signed Part Submission Warrant. PPAP submission may be requested for, but not necessarily limited to, one or more of the following:

- New Part/Product or New Tool
- Engineering Changes to design records,
- Tooling Transfer, Replacement, Refurbishment
- Correction of Discrepancy
- Change to Optional material
- Change in Part Processing
- Sub-supplier or Material Source Change
- Annual verification
- Production from tooling and/or equipment transferred from or to a different plant location

5.2 General Guidelines - CONTINUED

The default submission level for PPAP submissions to Jabil is Level 3 (described below in Figure 1) unless otherwise specified at the time of request. Regardless of the submission level requested, the supplier's quality records (PPAP Records) should contain the necessary elements for a Level 3 submission. It is the sole responsibility of the supplier to perform and keep current these elements and have them readily available for Jabil representatives on request. PPAP records should be maintained by the supplier and updated as necessary to reflect current revision documents (i.e. FMEA).

5.3 Level Assignment

5.3.1 Guidelines for determining an appropriate submission level are presented in section 6.4 (below).

5.3.2 A request for submission at any level or any combination of elements in a level does not relieve the supplier of the responsibility of performing and keeping current all required elements.

5.4 Elements of Default Levels

5.4.1 Figure 1 identifies specific PPAP submission contents for each submission level. This forms the minimum level of elements that must be included in a PPAP submission. Additional elements may be requested / required and will be communicated at the time of notification of a request for submission.

5.4.2 FIGURE 1

Figure 1:

Level 1 – Part Submission Warrant (PSW) only. For designated appearance items, an Appearance Approval Report (AAR), if applicable shall be submitted.

Level 2 – PSW with product samples and limited supporting data.

Level 3 – PSW with product samples and complete supporting data. (See figure 2 for most common Level 3 elements. Actual required elements to be determined by Jabil quality representative.)

Level 4 – PSW and other requirements as defined by Jabil.

Level 5 – PSW with product samples and complete supporting data for review at supplier's location.

5.4.3 FIGURE 2

Figure 2: (Common elements of a Level 3 JPPAP Submission)

SUBMISSION LEVEL

Requirement	***Level 1***	***Level 2***	***Level 3***	***Level 4***	***Level 5***
Feasibility Reports	S	S	S	S	S
Packaging Proposal for Customer Approval	S	S	S	S	S
Design Records	R	S	S	*	R

Engineering Change Documents*	R	R	S	*	R
Customer Engineering Approvals*	R	S	S	*	R
Design FEMA	R	R	S	*	R
Process Flow Diagrams	R	R	S	*	R
Process FEMA	R	R	S	*	R
Dimensional Results / FAI	R	S	S	*	R
Material, Performance, and Test Results	R	S	S	*	R
Initial Process Study	R	R	S	*	R
Measurement System Analysis Studies	R	R	S	*	R
Qualified Laboratory Documentation	R	S	S	*	R
Control Plan	R	R	S	*	R
Part Submission Warrant (PSW)	S	S	S	S	R
Appearance Approval Report*	S	S	S	*	R
Sample Product	R	S	S	*	R
Master Sample	R	R	S	*	R
Checking Aids	R	R	S	*	R
Records of Compliance	R	S	S	*	R

S = The supplier shall submit designated product approval activity and **retain** a copy of records or documentation items at appropriate locations including manufacturing.

R = Supplier shall retain at appropriate locations, including manufacturing, and make **readily** available to Jabil representative upon request.

* = If required or applicable.

5.4.3.1 COMMENTS:

JPPAP Evidence Table is based on AIAG Guideline-book.

5.4.3.2 Notes: Some other Customer / Jabil applicable requirements are – but not limited to- :

Flammability.

SPC

Error Proofing.

Form, Fit and Function.

Feasibility.

ROHS (Restricted or Hazardous Substances) or other Hazardous Material Certification/Documentation such as IMDS.

EICC (Electronic Industry Code of Conduct) Certification/Compliance

MSDS (Material Safety Data Sheets)

UL requirements.

Yield and other important and/or critical activities to mitigate during validation/production stages.

Customer Drawing Notes Specific Requirements.

5.5 Default PPAP submission levels

5.5.1 Figure 2 indicates the level designation assumed for common scenarios seen in the part development cycle.

Figure 2:

Submission Basis	Level	Contact
Tooling Transfer	3	TE / DE & SQE
Tooling Replacement or Tooling Addition	3	TE / DE & SQE
Correction of Discrepancy	2 or 3	SQE
Sub- Supplier or Material Source Change	2 or 3	SQE
Process Change – Not affecting Fit, Form or Function	2 or 3	SQE
Optional Material	2 or 3	DE & SQE
Tooling Transfer	3	TE / DE & SQE
Tooling Replacement or Tooling Addition	3	TE / DE & SQE

*DE = Design Engineering *TE = Tooling Engineering *SQE = Supplier Quality Engineering

5.6 ELEMENTS

5.6.1 This section points to the approved tools for each PPAP Element and the nature of the content presented therein. Ownership for review / approval of each element must be assigned prior to the requested date for PPAP submission from the supplier. Jabil ownership for approval is partitioned based on element content between Jabil Design Engineering, (Design and Tooling) and Supplier Quality Engineering (SQE).

5.6.1.1 Part Submission Warrant

This document must be submitted with every new custom product or change to an existing process. See section 2.1; this warrant will document the status of a supplier submission(s). Acceptance, Restricted/Conditional Acceptance, or Rejection will only be communicated by this signed warrant, see section 3.4.

This is required to be submitted with every PPAP submission. See section 2.1. The status of a PPAP submission after is has been submitted will be communicated to the supplier via the Part Submission Warrant.

1. If the values obtained and documented in the PPAP Submission report do not meet the requirements as defined by this document / or product documentation, specification or requirements, the Supplier must notify the Jabil Requestor via the "Parts Submission Warrant" block titled: "**Submission Results."**

5.6.1.2 APPEARANCE APPROVAL REPORT

For all submissions dealing with part cosmetics, 6 samples should accompany or follow the warrant and PPAP data. Samples should be submitted to Jabil Design Engineering & Site SQE or other designated appropriate Jabil personnel for approval for initial product launches (NPI). Signed copies of the approval document(s) along with the sample(s) signed by Jabil Design Engineering / SQE for which the document represents shall be maintained on file at each of the supplier's sites which manufacture the part. Note: 3 signed sample parts will be kept at Jabil site and 3 returned to the supplier for reference. The samples shall be retained for one (1) year after the end of life of the product. After a year, new samples need to be evaluated to determine if new golden samples should be defined. Note: Sample size may be less than 6 but never less than 2.

For guidance on the application of cosmetic standards, Jabil customer standards have priority. If no customer standards exist, reference Jabil Workmanship Standards For Systems Integration, 4-QC60-1000-003-X.

5.6.1.3 Gage Repeatability and Reproducibility Report

To be executed on all critical process control features identified on engineering documentation, including continued use data for process characterization. The minimum level of study shall include 2 operators x 2 trials and must meet minimum requirements of </= 10% total. See JPPAP Templates.

6.6.1.3.1 Gage R&R System Acceptability

- % R&R<10% - *Gage* System is acceptable.
  (Most variation caused by parts, not people or equipment)
- % R&R<30% - May be acceptable or Marginal acceptable based on importance of application and cost of *gage* or repair.
- % R&R>30% - *Gage* system needs improvement or not acceptable.
  (People and equipment cause over 1/3 of variation)

NOTE: These are general values. Individual companies or customers must establish their own criteria.

5.6.1.4 Process Capability studies

The critical process control and/or significant dimensions for the capability studies are identified and/or agreed between supplier and a Jabil/Customer representative on the engineering documentation such as drawings, specifications, specific requirements and others. The study shall be done on a minimum sample of 30 random pieces taken from a minimum population of 300 and should be submitted using the form in the JPPAP Template document or Jabil approved equivalent. In the case of multi-cavity tooling, samples submitted, FAIR(s), and capability studies are to be ran and measurements identified as per each cavity or tool. If expected production or quantities of parts ordered do not lend themselves to the 300 piece minimum sample population, then written authorization is required from JTS Design or Supplier Quality Engineering.

Minimum level of Cpk is: Cpk >/= 1.67. Cpk level might be different if a specific value is required by final customer. If the statistical data on the capability study does not meet Jabil specified goals the supplier must notify Jabil Design Engineering and Jabil

Supplier Quality Engineering via the "Parts Submission Warrant". Additionally, the supplier shall provide an explanation as to why the finished units do not meet the requirements and propose possible solutions, which could include containment efforts (e.g. 100% sorting /screening) to enable the process to be classified as capable.

If the Customer requires, the results of Form, Fit & Function tests performed by supplier might drive drawing and/or tolerance adjustments to meet CP & CPK requirements. After dimensional adjustments the supplier is responsible to meet and maintain their process capability within specified ranges and re-submit JPPAP.

5.6.1.5 Dimensional evaluation - (FAIR) First Article Inspection Report

Suppliers shall submit three (3) samples of each part or assembly, from each tool and or cavity, for approval prior to producing production units. Samples shall be taken from normal settings or parameters established by the supplier to be used during normal production. The submission shall

include components and sub-assemblies supplied to Jabil sub-contractors and shall be produced by means following the referenced production process flow from the JPPAP. All First Article parts must be submitted with a Product Submission Warrant (PSW).

Each sample will be numbered and supplied with data taken on each dimension identified on the print. In the case of multi-cavity tooling, samples are segregated and measurements recorded individually by cavity. (Note: The supplier shall measure all dimensions reflected in the drawing in three (3) samples per cavity/tool. Besides, the supplier shall report in the FAIR their compliance with all drawing notes).

Each sample will be numbered and supplied with data taken on each dimension identified on the print. In the case of multi-cavity tooling, samples are segregated and measurements recorded individually by cavity. (Note: The supplier shall measure all dimensions reflected in the drawing in three (3) samples per cavity/tool. Besides, the supplier shall report in the FAIR their compliance with all drawing notes).

If the values identified in the Dimensional report do not meet the requirements as defined on the piece part print the Supplier must notify Jabil Design Engineering via the "Parts Submission Warrant" block titled: "**Submission Results."**

If the parts fail to meet any JPPAP requirements the supplier must address, with cause and corrective action, all discrepancies via the F.A.I.R. (First Article Inspection Report) Deviation Report Template.

F.A.I.R DEVIATION REPORT - This document is a tool to record all discrepancies and subsequent causes and corrective actions relevant to the JPPAP submission.

5.6.2 Process Failure Modes Effect Analysis

A Process FMEA shall be executed for each part and shall be the basis for stipulated process controls stated on the "Control Plan". Actions shall be taken by suppliers for RPN >= 100 and also for the three items showing the highest RPN number (risk priority number), which requires corrective actions and enhanced process controls and also reflected in the Control Plan. (Note.- USE AIAG tables to apply Severity, Occurrence and Detection ranks).

5.6.3 Process Flow Diagram

The Process Flow Diagram should follow the guidelines identified in the JPPAP template or an approved equivalent. This process flow once submitted and accepted cannot be significantly altered without Jabil approval and resubmission of JPPAP.

5.6.4 Process Control Plan

The Process Control Plan should follow the guidelines identified in the referenced JPPAP template document or an approved equivalent (Example AIAG PPAP Reference).

5.6.5 Process Work Instruction

The Process Work Instructions are user defined, however, Jabil Design Engineering and Supplier Quality Engineering reserve the right to review and approve such documentation.

5.6.6 Packaging

During JPPAP submission, the packaging needs to be considered for evaluation and approval process by all the parties. (Customer, Jabil and supplier). The package needs to maintain the product integrity from manufacturing facility through the final customer or user.

5.6.7 Element Exceptions

The scope of the items listed in this procedure is not so complete that it preempts inclusion of any other activities deemed appropriate by Jabil in order to grant a qualified status.

6. RESPONSIBILITIES

6.1 Jabil Design Engineering

Jabil Design Engineering is responsible for disposition of documents that pertain to the form, fit and function of the part for use in the application. These elements usually pertain to dimensional features and attributes defined by piece part or assembly drawings and specifications. See attached process flow diagrams and Figure 3.

FIGURE 3.

1. **Elements approved by Design Group if a Jabil initiated design.**
2. **Tooling Validation - cavities.**
3. **Dimensional First Article (FIA)**
4. **Process Capability Studies**
5. **Appearance Approval Report (AAR)**
6. **Correlation/Interchangeability Studies**
7. **Warrant**

6.2 Supplier Quality Engineering

Jabil Supplier Quality Engineering is responsible for disposition of all documents (elements – See Section) that pertain to the quality and integrity of the manufacturing processes and metrics of the resultant part.

6.3 Jabil Site Management (Ops Mgr / Purchasing Mgr / Quality Mgr)

Top Site Management is responsible to develop, train and implement the JPPAP activities with the Jabil supply base at their own site. (SQE's, Quality, Engineering, Purchasing, other teams).

6.4 Disposition Status

Disposition status shall be communicated to the supplier utilizing the Part Submission Warrant Document, properly signed by Jabil. Status description and details are found in section 3.4 for this procedure.

6.5 References

When critical characteristics (CC's) are not mentioned on the drawing, then Customer/Jabil/Supplier will need to review the drawing and agree to identify them based on Form, Fit and Function and the performance of said part or assembly that is expected in the field.

CC´s identification, inspection method(s) and cosmetic acceptance criteria shall be agreed during design review and JPPAP process **prior** to start production run.

All relevant data, dimensional studies and Cpk values will be reported in the JPPAP and submitted to Jabil for review and approval.

6.6 Records

JPPAP Submission Package

The supplier shall maintain records of all documents identified in Section 6.4.3 (as indicated in Figure 2) for each part produced for use in Jabil product.

Individual PPAP Files to be held by the appropriate parties, e.g., Design Engineering, applicable Work Cell Quality Engineer or Supplier Quality Engineer working with the work cell, (ownership is defined by the flow charts). Record retention is based on each Jabil site's own requirements based on site management or customer direction.

6.7 Jabil Business Unit – Inform the Corporate Materials Quotation team that this work instruction is in place and applicable at the time of a Request for Quotation.

6.7.1 Jabil Business Unit is to lead in the coordination of JPPAP requirements and PSW Level, if applicable to the Customer.

6.7.2 RFQ will contain a check mark to alert the Jabil supply base about the possibility that they may be required to submit a JPPAP to a Jabil representative in the event that the product or business has/have been awarded to them.

6.8 Jabil Purchasing Representative – To ensure JPPAP requirement for part approval is specified on the Purchase Order and to direct Supplier to Jabil SQE (or designated responsible party) for document submission. Questions regarding submission and JPPAP process should also be directed to Jabil SQE or responsible designate. (See section 6.2.3)

7. Required Outputs

7.1 Employees responsible for creating/maintaining the JPPAP procedure and guidelines within their own site. Jabil Site Management is responsible to develop, train and implement the scope and importance of the JPPAP activity.

8. Associated Documents

8.1 Part Submission Form

Part Submission

Jabil Production Part Approval Process (JPPAP)

Submission Date:		Part Description:					
Part Number:		Revision / ECN:		Project Name:			
Drawing No / Rev		Drawing Pages			Part Weight (grms):	Runner Weight (grms):	PPAP Level
Details of Submission							

Supplier Information and Declaration

Name: _____ Submitted By: _____

Address: _____

Location: _____ Reviewed By: _____

Submission Reason	Submission Documentation	Need for this Submission (Y/N) ?	Re-Submitted(Change)/ Initial Submission
☑ Initial Submission	Sample(s) / AAR		☐
☐ Engineering Change(s)	Capability Study		☐
☐ Tooling:Transfer, Replacement, Refurbishment, or additional	Dimensional Evaluation (FAI)		☐
☐ Correction of Discrepancy	Deviation / Action details		☐
☐ Change to Optional Material	Gage R&R		☐
☐ Change in Part Processing	Process FMEA		☐
☐ Sub-Supplier, Manufacturing or Material Source Change	Process Flow		☐
☐ Tooling inactive > 12 Months	Process Management Plan / Org Chart		☐
Dimensional FAI Submission Results	Process Work Instructions		☐
Parts / Samples meet all drawing specifications requirements (Tick appropriate box)	Training Skills Metric		☐
	Master Gauge / tooling list		☐
Yes ☐	Control Plan		☐
No ☐	RoHS Accomplishment / Information per P/N		☐
Deviation- Action sheet to be completed	Other (Define Below)		☐
Parts are cosmetically acceptable			
Yes ☐ No ☐			

Is each Customer Tool properly tagged and numbered ? Yes ☐ No ☐ Tool Order No. _____

Print Name: _____ **Title:** _____ **Phone:** _____ **Fax:** _____

Supplier Authorized Signature: _____ **Email:** _____ **Date:** _____

Supplier Comments

Submission Sign Off (Jabil / Customer)

Approval Status			
Approved	☐	**Jabil Quality / Engineering - Site (Signature)** _____	**Date** _____
Rejected	☐	**Printed Name** _____	
Conditional Approval	☐	**Customer Quality / Engineering (Signature)** _____	
Approved / Agreed Run Rate		**Printed Name** _____	**Date** _____

Ref Deviation / Action sheet for Reject / Conditional Approval / Details fo Conditional Approval : _____

Comments:

8.2 Appearance Approval Report

JABIL APPEARANCE APPROVAL REPORT (AAR)

Part # :		Part Name:		Project Name:	
Drawing #		Revision Level:		Rev Date	

Submission Date: _____

COLOR EVALUATION (Spectrophotometer Readings):

Color Name: _____ Coating Type: _____

Color Standard No. _____ Coating Supplier : _____

Spectrometer Readings of samples versus color standard.
Measurement mode, CIE L*, a*, b*, 10deg. Observer, specular gloss included

	Delta L*	Delta a*	Delta b*	Delta E	*Gloss Measurement (Define -a and b- Locations) a	b
MASTER Color chip readings						
Sample 1 readings						
Sample 2 readings						
Sample 3 readings						

Color and Gloss Readings were taken on : Non textured side: ☐ Textured side: ☐
*(Specify with a check-mark)

Comments _____

TEXTURE EVALUATION:

DESCRIBE Texture requirements/standards: _____

DESCRIBE Method of inspection: _____

Results of Inspection: _____

APPEARANCE & COSMETIC EVALUATION:

Cosmetic requirements/ -standard procedure number- _____ Procedure Date/Rev:

Method of inspection: _____

SAMPLE 1

	Class A	Class B	Class C	Class D
Pass				
Fail				

SAMPLE 2

	Class A	Class B	Class C	Class D
Pass				
Fail				

SAMPLE 3

	Class A	Class B	Class C	Class D
Pass				
Fail				

SAMPLE 4

	Class A	Class B	Class C	Class D
Pass				
Fail				

SAMPLE 5

	Class A	Class B	Class C	Class D
Pass				
Fail				

SAMPLE 6

	Class A	Class B	Class C	Class D
Pass				
Fail				

SIGNATURES AND APPROVALS

Comments _____

STATUS:	Approved	Reejected	Cond. App

Customer Approval

Printed Name: _____ Signature: _____ Date: _____

Jabil Site Quality / Engineering : _____ Signature: _____ Date: _____

Note: **If golden or boundary samples are approved and signed off by Customer, Please submit a couple of the most representative parts to the supplier for future reference.**

8.3 Six Sigma Process Capability Worksheet

6-Sigma Process Capability Calculation Worksheet
Form 00-MT80-0000-007-A

PART NUMBER: _____ REV: _____ PART DESCRIPTION: _____

REVIEWED BY: _____ DATE REVIEWED: _____

	Dim # 1	Dim # 2	Dim # 3	Dim # 4
Nominal	0.157	0.198	0.118	
UPPER LIMIT	0.162	0.203	0.123	
LOWER LIMIT	0.152	0.193	0.113	
AVERAGE	0.157833	0.15786667	0.1579	#DIV/0!
STD	0.000913	0.000730	0.000548	#DIV/0!
Cp	1.8	2.3	3.0	#DIV/0!
Cpku	1.5	20.6	-21.2	#DIV/0!
Cpkl	2.1	-16.0	27.3	#DIV/0!
Cpk	**1.5**	**-16.0**	**-21.2**	**#DIV/0!**
MIN	0.153	0.154	0.155	0
MAX	0.158	0.158	0.158	0

FILL THE REQUIRED INFORMATION

		Dim # 1	Dim # 2	Dim # 3	Dim # 4
Sample #		Variable 1	Variable 2	Variable 3	Variable 4
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
		Variable 1	Variable 2	Variable 3	Variable 4
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

8.4 First Article Inspection Report (FAIR)

FIRST ARTICLE / FIRST PIECE / INSPECTION REPORT (FAIR)

	Customer		Part Description:				
Supplier Part No:		Jabil Part No :		Dwg. #		Dwg. Rev Level.		Dwg. Last Revision Date:	
No. of Cavities:		Blocked Cav. No.:		Requested By:		Date:	
Material Type:		Tool ID #		Inspected By:		Date:	
REMARKS:				Program Mngr:		Date:	

MEASURING APPARATUS (ABBREVIATION TABLE) **CMM** = COORDINATE MEASURING MACHINE, **DG** = DEPTH GAUGE, **HG** = HEIGHT GAUGE, **IM** = INTERNAL MICROMETER, **COMP.**Comparator Optico **PG** = PIN GAUGE, **M** = MICROMETER, **AV** = Avant , **CAL** = CALIPER

Total # of Dim. Checked : 121 % OUT OF TOL. 8.26% Dims above 6 Dims below 4 **Total # of Reject :** 10

DRAWING SPECIFICATIONS ☐INCH MM						INSPECTION RESULTS															INSPECTION ANALYSIS			
						Cavity #							Deviation from Nominal									% Tolerance		Reject	
Drg. Desig-nator No.	Description	Dimensions, Notes or Standards	+ Tol.	- Tol.	Inspection Method	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample for Comparisson			Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample for Comparisson		Mean	Upper	Lower	High	Low
1	Distance	55.98	0.00	0.13	Vernier	56.00	55.99	55.00	55.92	55.92	55.98	55.98	55.98	0.020	0.010	-0.980	-0.060	-0.060	0.000	0.000	0.000	55.766		754%	Reject	Reject
2	Distance	41.18	0.00	0.13	Vernier	41.00	41.14	41.15	41.15	41.15				-0.180	-0.040	-0.030	-0.030	-0.030				41.118		138%		Reject

*POAT BALLOONED DRAWING

8.5 First Article Inspection Deviation Report

F.A.I.R Deviation report

Jabil Production Part Approval Process (JPPAP) Form 00-MT80-0000-004-A

Supplier Name		**Supplier Engineer Name**		**ISR / F.A.I.R ref No**	
Part No		**Drawings Affected**			

Deviation log to be completed for details of samples not meeting specific drawing specification requirements

Dev iation No	Drawing No / Rev	Drawing Location (Sheet No/ Grid ref)	Fail / Deviation Details	Use as is (Request to amend drawing)	Action to be taken prior to production	Other	Close Date

8.6 Measurement System/Gauge Capability Worksheet

MEASUREMENT SYSTEM / GAUGE CAPABILITY CALCULATION WORKSHEET
Form 00-MT80-0000-006-A

Part Number :		Description :	
Characteristic :			Zero=
Specification :		TTL Tolerance:	Measurement Unit:
Supplier Name		Analysis Supervised by :	
Inspector Name:		Date Inspected:	# Oprs
Inspector Name:		Date Inspected:	# Trials
Inspector Name:		Date Inspected:	

	OPERATOR 1				OPERATOR 2				OPERATOR 3			
Sample	Trial 1	Trial 2	Trial 3	Range	Trial 1	Trial 2	Trial 3	Range	Trial 1	Trial 2	Trial 3	Range
1				0.0000				0.0000				0.00
2				0.0000				0.0000				0.00
3				0.0000				0.0000				0.00
4				0.0000				0.0000				0.00
5				0.0000				0.0000				0.00
6				0.0000				0.0000				0.00
7				0.0000				0.0000				0.00
8				0.0000				0.0000				0.00
9				0.0000				0.0000				0.00
10				0.0000				0.0000				0.00
TTLS	0	0	0	0.000	0	0	0	0.0000	0	0	0	0.00
				0.0000				0.0000				0.00
	Sum	0.0000			Sum	0.0000			Sum	0.0000		
	X_A	#DIV/0!			X_B	#DIV/0!			X_C			

TEST FOR CONTROL

Upper Control Limit, UCLr = D_4R = 2.57000 x 0.00000 = **0.0000**

If any individual range exceeds this limit, the measurement or reading should be reviewed, repeated, corrected, or discarded as appropriate, and new averages and ranges should be computed

X min	#DIV/0!
X max	#DIV/0!
X diff	**#DIV/0!**

Factors

# Trials	2	3	# Oprs	2	3
K1	4.56	3.05	K2	3.65	2.70
D4	3.27	2.57	n=# parts, t=# trials		

MEASUREMENT SYSTEM / GAUGE / CAPABILITY

				Repeatability	% Tolerance
Equipment Variation ("Repeatability") = K_1R =	3.05000	x	0.00000	= **0.00000**	**#DIV/0!**
				Reproducibility	% Tolerance
Operator Variation ("Reproducibility") =	$(K2*Xdiff)^2 - (EV)^2/nxt$			**#DIV/0!**	**#DIV/0!**
				Total	% Tolerance
Total "repeatability" and "reproducibility" Variation (R&R) =				**#DIV/0!**	**#DIV/0!**

Notes:

8.7 G R&R Calculation for Attributes

Gauge Repeatability and Reproducibility Calculation Sheet for Attributes	JABIL

Supplier, location	ABC Ltd
Part number	123-456-489
Part description	Front cover
Characteristic	Visual appearance

COLOUR CODES

Must be filled in
Optional (recommended)
Results

Inspector1	John	Date	22-01-2009
Inspector2	Charlie	Date	22-01-2009
Inspector3	Mike	Date	22-01-2009

	Inspector 1			Inspector 2			Inspector 3		
Sample \ Trial	**# 1**	**# 2**	**# 3**	**# 1**	**# 2**	**# 3**	**# 1**	**# 2**	**# 3**
1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	0	0
6	1	1	1	0	0	0	0	1	1
7	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	0	1	1
12	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	0	1
14	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	0	1	1
16	1	1	1	0	0	0	1	1	1
17	1	1	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	0	0	0
21	1	1	1	0	0	0	1	1	1
22	1	1	1	0	0	0	1	1	1
23	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	0	1	0
25	1	1	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1	1	1
28	1	1	1	1	1	1	0	0	0
29	1	1	1	1	1	1	1	1	1
30	0	0	0	0	0	0	0	0	0

Repeatability	**100.0%**	**100.0%**	**80.0%**
% of consistent evaluation by each inspector			
Score	**96.7%**	**83.3%**	**70.0%**
% of consistent good evaluation by each inspector			

Reproducibility	**63.3%**	**Total score**	**60.0%**
% of consistency between inspectors		*% of consistent good decisions by all inspectors*	

8.8 PFMEA template for Reference (Use AIAG Tablets)

USE LATEST AIAG TABLES

PROCESS FMEA [Potential Failure Modes and Effects Analysis]

Form 00-MT80-0000-008-A

Supplier FMEA Team		Supplier Name		Jabil Customer Name		FMEA Number:	
Jabil SQE		Process stage		Part Number/s affected		Prepared by:	
		Key Date:				Date (Orig.)	
						Date (Rev.)	

Process Function/ Requirements	Potential Failure Mode	Potential Effect[s] of Failure	Sev	Class	Potential Cause[s] /Mechanisms of Failure	Occur	Current Process Controls Prevention	Current Process Controls Detection	Detec	R.P.N.	Recommended Action[s]	Responsibility & Target Completion Date	Action Res	
													Actions Taken	Sev

8.9 Process Control Plan Template Sample (Reference AIAG)

JABIL

Process Control Plan

Form 00-MT80-0000-005-B

Part Name		Approvals			Control Location	Abbreviations		
			Initials	Date				
Part Number		Q.A.						
		Production						
Revision	Plant Location	Engineering						
QA Manager	Jabil S.Q.E.	Revision Date	Revision Number	Eff. Date	Notes			

No.	Process Flow: Phase of Production	Machine, Device, Jig Tools For Manufacturing	Char No.	Characteristics: Process Parameters	Product Char. Loc./Design.	Product Critical Characteristics	Methods: Measurement Method	Sample: Size	Sample: Frequency	Analysis Methods	Cpk	Reaction If Out of Control	Control Location

8.10 Team Feasibility Worksheet

TEAM FEASIBILITY COMMITMENT

(SUPPLIER)

Customer: Date:

Part Number and Description: Program Name:

Feasibility Considerations

Our product quality planning team has considered the following questions, not intended to be all-inclusive in performing a feasibility evaluation. The drawings and/or specifications provided have been used as a basis for analyzing the ability to meet all

YES	NO	CONSIDERATION	COMMENTS
		Is product adequately defined (application requirements, etc.) to enable feasibility evaluation?	
		Can Engineering Performance Specifications be met as written?	
		Can product be manufactured to tolerances on drawing?	
		Can product be manufactured with Cpk's that meet requirements?	
		Is there adequate capacity to produce product?	
		Does the design allow the use of efficient material handling techniques?	
		Can the product be manufactured without incurring any unusual:	
		Costs for capital equipment?	
		Costs for tooling?	
		Alternative manufacturing methods?	
		Is statistical process control required on the product?	
		Is statistical process control presently used on similar products?	
		Where statistical process control is used on similar products:	
		Are processes in control and stable?	
		Are Cpk's greater than 1.33?	

Additional notes: a) Review material hardness to manufacture this part.
b) Review small holes vs thickness hardness material

Conclusion

	Feasible	Product can be produced as specified with no revisions.
	Feasible	Changes recommended (see comments).
	Not Feasible	Design revision required to produce product within the specified requirements.

Sign - Off

Team Member/Title/Date

Team Member/Title/Date

Team Member/Title/Date

Team Member/Title/Date

Team Member/Title/Date

Team Member/Title/Date

9. Quality Support Documentation

9.1 ***Include a Process Parameters Sheet for all manufactured parts submitted in this JPPAP.**

9.2 ***Include Work Instructions for all operations reflected in the Process Flow.**

9.3 ***Include a soft copy of ballooned drawing. Ballooned drawing should be marked up in a clockwise direction.**

9.4 ***Include a soft copy of Training Matrix of personnel related with manufacturing process described in the quality documentation. (Process Flow, Control Plan).**

9.5 ***Include a list of gages and key equipment to manufacture part(s) listed in the JPPAP.**

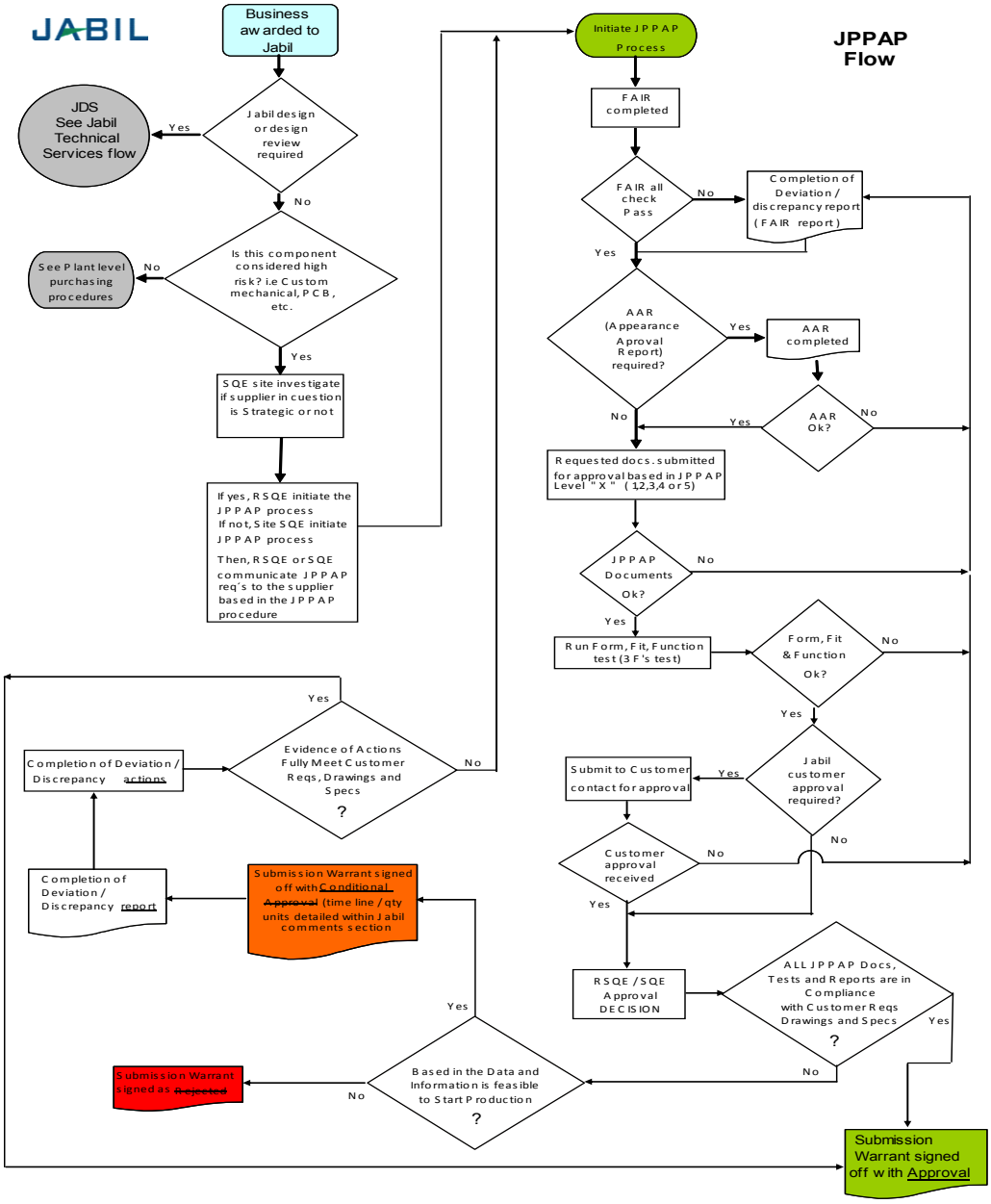
9.6 ***Include a soft copy of Raw Material Certificates.**

9.7 ***Include a soft copy of flammability and other reports – if applicable -.**

9.8 ***Include a soft copy of feasibility report performed by supplier.**

10. JPPAP Process Flow Chart

10.1 FIGURE 4



JABIL

This block diagram is to define JPPAP (Jabil Production Product Approval Process) Responsabilities w hen JDS has Design Authority