ZDPQ Workbook Outline Summary

Use this Overview page to help navigate and understand each of the worksheets. Each page/tab is hyperlinked below. Start the process by completing the Set Up worksheet.

Tab Name	Name from ZDPQ plan	Owner	Worksheet/template use?	Instructions
Set Up	na	Plexus	Reference only	Enter all project related data on appropriate fields. The data will be transferred throughout the workbooks accordingly.
Part list	na	Plexus	Use as needed	List all part numbers used on the ZDPQ Plan. The template is intentionally in the same format as the Supplier Zero Defect Launch process.
Supplier Review	na	Reference	Reference only	Explanation of the ZDPQ Process and early supplier engagement review process.
ZDPQ Plan	na	Plexus	Required	Complete the appropriate fields to define and document the initial ZDPQ criteria. This will be agreed upon in the early engagement process.
ZDPQ Approval	ZDPQ Approval	Supplier	Preferred	Summarize the completion of deliverables and submit for approval, similar to a Part Warrant.
ZDPQ Review	Part of the ZDPQ Review	Plexus	Optional	Document early engagement Supplier Review process. Use inputs for ZDL process.
Design Requirements Review	Part of the ZDPQ Review	Plexus	Optional	Document early engagement Design Requirements Review process.
DFMEA	DFMEA Chart or Table	Plexus/Plexus customer	Use when available	Plexus or customer formatted: DFMEA
Process Flow Diagram	Process Flow Diagram	Supplier	Optional	Process Flow Diagram
PFMEA	PFMEA Chart or Table	Supplier	Optional	Process FMEA
Control Plan	Control Plan	Supplier	Optional	Control Plan
MSA - Data Entry	MSA report	Supplier	Optional	MSA Data Entry. Record MSA data, which will generate the MSA Report and MSA Graph.
MSA - Report	MSA report	Supplier	Optional	No input required. Auto-generated from MSA Data Entry.
MSA - Graph	MSA report	Supplier	Optional	No input required. Auto-generated from MSA Data Entry.
FAI - Dimensional report	FAI/Dimensional Report	Supplier	Optional	Record First Article Inspection data.
Master Sample	Master Sample parts	Supplier	Reference only	Instructions for the control and management of master samples as required.
Material Certification	Material Certification Report	Supplier	Optional	Include all RoHS and REACH requirements and material testing results as required.
Lab Certification Report	Certification Report for Laboratories	Supplier	Optional	Certification reports for any outside test labs.
Appearance Report	Appearance Report	Supplier	Optional	Report color measurements and cosmetic defects based on acceptance criteria identified on the part level drawing. Customize the template to reflect each part's specific requirements.
Process Control - Capability	Report with capability studies and applicable statistics	Supplier	Optional	Report Process Capability studies data and results
Packaging	Packaging Plan	Supplier	Optional	Document packaging strategy for shipment.
Regulatory Report	Compliance testing report	Supplier	Optional	Report Regulatory Compliance testing data and results
NA	Special TMV IQ/OQ/PQ report as agreed	Supplier	Supplier can use their own	Per ZDPQ Plan
NA	Assign Q-code	Supplier	Reference only	Per ZDPQ Plan

ZDPQ Set Up

Start the process by entering the Part Specific information here. This will populate all the other sheets with the needed and pertinent information.
If the ZDPQ plan covers multiple parts, you can state "see Part List" or similar in the Part related fields. The list of applicable parts can then be added to Workbook tab labeled Part List. Otherwise, Multiple Set up sheets or Multiple workbooks can be used.

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>
Supplier Location	<enter>		
Supplier Contact	<enter>	Plexus SQE	<enter>
Email Address	<enter>	Purchase Order Number	<enter>

Submission Requirement	Date Initiated	Review date
<Select from list>	<enter>	<enter>

Customer Name	<optional>	Cavities/Number of pieces per tool	<optional>
Customer MPF	<optional>	Estimated Run Size	<optional>
Project/Program	<optional>		
Commodity	<optional>		

Characteristic Management table (optional, add or delete rows as needed). You can also add a column for PN if it is needed.

Characteristics	Description	Cp	CpK	Min. Sample size for the cap study	MSA %
<Characteristic #1>	<enter description of characteristic 1>	1.33	1.33	30	10
<Characteristic #2>	<enter description of characteristic 2>	1.33	1.33	30	10
<Characteristic #3>	<enter description of characteristic 3>	1.33	1.33	30	10
<Characteristic #4>	<enter description of characteristic 4>	1.33	1.33	30	10
add or delete as needed	<enter description of characteristic X>	1.33	1.33	30	10

Prepopulated values are standard Plexus requirements. These values can be modified, with justification, for special requirements.

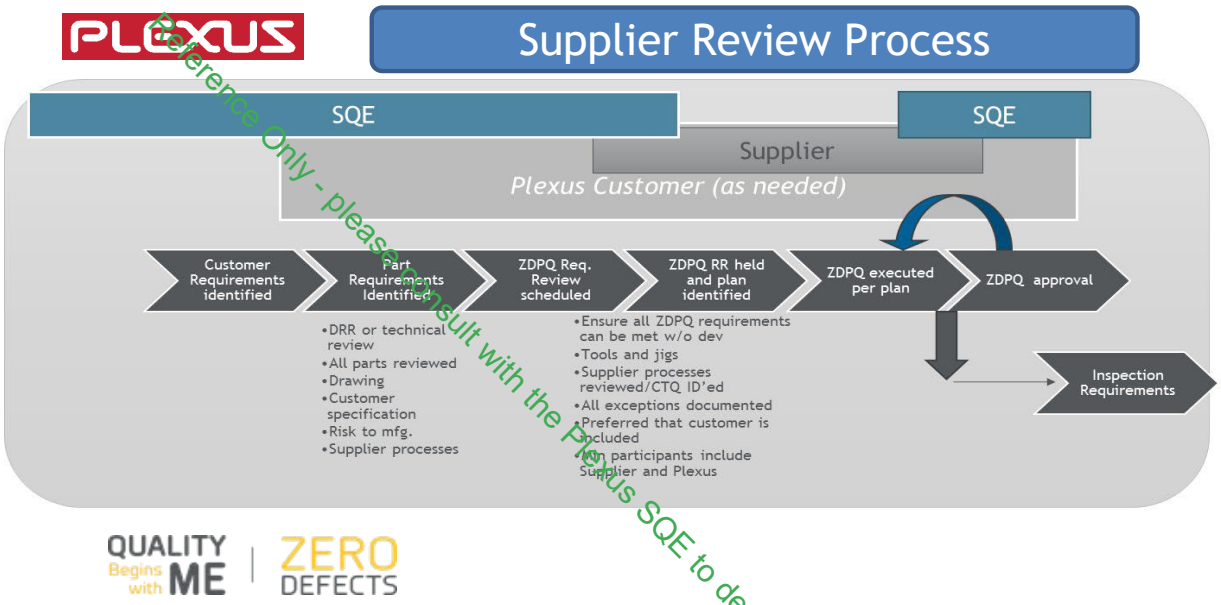
Parts List

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>
Supplier Location	<enter>		
Supplier Contact	<enter>	Plexus SQE	<enter>
Email Address	<enter>	Purchase Order Number	<enter>

NOTES: It is preferred that a ZDPQ plan is completed for each part number, but when applicable, a parts list can be inserted here. The part list shall include all part numbers, revisions, part descriptions and drawing numbers covered by this ZDPQ plan. A Parts list can be used when all parts have the same supplier with common features and common risks. Any variation to the ZDPQ criteria can be described in the Comment column of the ZDPQ plan. When the ZDL process is used, copy and paste the part list form the ZDL workbook for the applicable part numbers. Columns can be added or subtracted as needed for the project.

NOTE: the headers/format in the following table are intended to start out as a duplicate of the part Qualification Plan table that is included in 14388

BOM related data												Qualification Code (Update/Insert columns as appropriate)		Qualification Requirements - Proto/Pilot Build (Update/Insert columns as appropriate)			Qualification Requirements - Pre-Production/Production (Insert columns for the deliverables requiring monitoring. Those included below are examples)						Qualification Execution Tracking (Insert columns for the deliverables requiring monitoring. Those included below are examples)									
Customer Part Number	Stocking Type	Plexus Part Number	Part Number Revision	Part Description	Custom (CEC) or OTS?	Commodity (Component Type)	Manufacturer	Part Risk (TBD on project by project basis)	Responsible SQE	Design Engineer	Tooled Part (Yes or No)	Proto / Pilot Code	Pre-Production / Production Code	FAIR	Material Cert	100% Data on OTS	FAIR	Process Flow	FMEA	Control Plan	MSA	Capability Study	ETD for Documentation	Documentation Actual	ETD for Completion	Completion Actuals	Qualification Status	Status Flag	Comments	Plexus Qualification Complete	Inspection Code (JDE)	TipQA Setup Complete



ZDPQ SUPPLIER REVIEW AND PLAN DEVELOPMENT

The Requirements Review will be used to coordinate inputs from Design/Drawing/Technical/ZSDL review to review and designate the ZDPQ requirements to develop agreement from all the responsible parties for the specific ZDPQ plan.

A Plexus SQ Project Leader will be assigned by the Customer Focus Team and/or Plexus Quality management as appropriate to coordinate the ZDPQ process. The Supplier Review and Plan Development should include a meeting or meetings series with the supplier to reach the appropriate part qualificiation agreements.

Supplier/Inputs

Customer - Design Engineering
Customer - Quality Engineering
Customer - Qualification Requirements
Plexus - Customer Focus team (CFT)
Plexus - Sourcing/Commodity Leader
Plexus - SQ Project Leader
Plexus - Mfg process/engineering needs at Plexus
Supplier - Quality process or department
Supplier - Mfg/Process engineering or department

Process

Review all inputs with team
Ensure mutual understanding of the requirements
Determine outputs
Determination of proposed ZDPQ schedule/dates

Output/Customer

Designation of which ZDPQ elements are required
Are special deviations for R&R, CpK, sample qty, etc. needed
Complete and signed/approved ZDPQ plan
Storage plan and System set up
Plan for preproduction and Post approval requirements(Q-code)
PO with ZDPQ requirements (using TP Part numbers)
Execution strategy for Qualification plan

Zero Defect Part Qualification Plan

Supplier Instructions:

This document will define and document agreement for the initial ZDPQ criteria. Any alternative or change must be documented in comments and mutually agreed upon with approval.
- Use this form to set up, ensure understanding and document the ZDPQ plan with the supplier
- Supplier to include the Header elements or a Tracking Code on all the documentation/ deliverables
- Any certifications or test reports shall include an evaluation, a description of the evaluation used and the test results with an appropriate approval signature and date
- Supplier to flowdown and execute the Part Approval requirements for all custom subcomponents or subcomponents with CTQs. Any alternate plan or exceptions must be approved by Plexus SQ or SQ Project Mgr
- *The Supplier is encouraged to provide the documents and materials as they are completed and provide regular updates to Plexus SQE*
- The control plan must be updated and resubmitted with any changes that are initiated during the qualification process
- *All cells in this worksheet containing Red TEXT must be completed with information BEFORE approving/signing the ZDPQ plan.*
- *Template elements and guidance are included in the additional Workbook tabs, please reference the tab description for the applicable information. If a template must be used, it shall be agreed upon and documented with approvals in the comments during the ZDPQ review.*

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>
Supplier Contact	<enter>	Plexus SQE	<enter>
Email Address	<enter>	Purchase Order Number	<enter>

Submission Requirement	Date Initiated	Review Date
<Select from list>	<enter>	<enter>

Part Approval Requirements

Requirement	Required Supplier Deliverable	Scheduled Completion Date	Required Element?	Comments	Instructions
1) Supplier engagement/kick off 2) Review part from a DFM standpoint 3) Establish and flow down ZDPQ req. 4) Establish understanding of the part and quality requirements by the supplier	ZDPQ Review	<date>	YES	<Replace with Comment or None>	A Cross-functional meeting between Plexus & the Supplier shall be conducted to verify drawing and procurement specification alignment. The Plexus customer and CFT shall be included when possible or appropriate. The review shall provide an agreement of Critical to Quality (CTQ) characteristics, part specifications, cosmetic specifications, cosmetic concerns, manufacturability concerns and the expectation of Plexus Part Qualification Requirements. Comments and expected completion date will be populated for all Requirements.
Risk inputs from product/Design are included in process design and ZDPQ plan	DFMEA chart or table	<date>	YES	<Replace with Comment or None>	DFMEA results to be included when they are available. Review DFMEA with the supplier during Requirements Review. Choose No if the DFMEA is not available or part of the ZDPQ plan.
All parties have a complete understanding of the processes used to manufacture the parts	Manufacturing Diagram or flow chart	<date>	YES	<Replace with Comment or None>	Supplier to complete and provide a detailed Process Flow. the Process Flow should include all steps in the supplier's manufacturing process including process steps, inspections, rework, outside processing, special processes and acceptance activities used to produce the qualified product.
Risk inputs from Supplier's manufacturing process is included in process design and ZDPQ plan	PFMEA chart or table	<date>	YES	<Replace with Comment or None>	Supplier to complete and provide a pFMEA shall correspond with process flow diagram. Risky RPN values must include a remedy. Final determination of severity and risky RPN levels must be approved by Plexus.
Supplier has a frozen process with Control Points defined and documented	Control Plan	<date>	YES	<Replace with Comment or None>	Supplier should complete and provide a Control Plan. The Control Plan should correspond with the process flow diagram and PFMEA. Process steps, tooling, Inspection points, gaging, rework processes, outside processing and acceptance activities used to produce the qualified product.
An appropriate Measurement System is used to verify control and compliance of the process and parts being produced	MSA Report	<date>	YES	<Replace with Comment or None>	CTQ features need an MSA completed on the gaging used for verification. Gage R&R shall be 10 % or lower with the number of distinct categories (NDC) greater than 5. For Gage R&R is between 10% and 30% the supplier should attempt to improve the gaging strategy and with investigation provide justification to Plexus for an allowance.
Evidence that all characteristics are within design specifications. Multi-piece FAI and tolerance limitations are used to indicate variation.	FAI/Dimensional Report	<date>	YES	<Replace with Comment or None>	A drawing accompanying the FAI shall be ballooned. All dimensions, characteristics and notes shall be verified and included on the dimensional report. Dimensional reports shall be completed on a minimum of 3 pieces. Use comments to specify when a specific format such as AS9102 is required. Note: additional control such as "All dimensions should be within 75% of the tolerance limit" or minimum of 5 pieces will be documented in the comments section.
Plexus to have samples parts provided for reference and additional verification	Master Sample parts	<date>	YES	<Replace with Comment or None>	Submit the parts used for each Dimensional Report as samples. Parts must be clearly marked and submitted with the Qualification documentation.
All raw, purchased, assembly materials and outside process are in compliance with the specifications	Material Certification Report	<date>	YES	<Replace with Comment or None>	Submit material and material test reports for the material used to produce and complete the Part Qualification. The material report must include specifics for all materials use. A material test report shall be needed for any special or control parameters.
Use only Qualified Laboratories for internal and external testing	Certification Report for Laboratories	<date>	YES	<Replace with Comment or None>	When external laboratories are used, evidence of accreditation to ISO/IEC 17025 or equivalent national standard shall be provided. For internal testing, the tester calibration certificate or similar shall be provided. Choose No if this is not a required.
Cosmetic/Appearance quality	Appearance Report	<date>	YES	<Replace with Comment or None>	Supplier to submit a cosmetic appearance report and samples for Plexus approval of any cosmetic related conditions they may exist in Production parts. Details and opportunities should be determined during pFMEA and the DRR. Process Inspections and controls should be documented on the control plan. Choose No if this is not a required.
Demonstrated Process Control	Report with capability studies and applicable statistics	<date>	YES	<Replace with Comment or None>	CTQ features require process studies. Cpk shall be 1.33 or higher using a minimum sample of 30 pieces using 10 subgroups of 3 pieces. When the Cpk value is lower than 1.33, the supplier should thoroughly research the cause to understand the source of the variation. When the cause is not reasonably controllable, the supplier will need to provide justification for approval and complete 100% inspection of the CTQ. The control plan will be upgraded to reflect this change.
Product to be appropriately protected, shipped and available for depacking	Packaging Plan	<date>	YES	<Replace with Comment or None>	Supplier should develop a packaging methodology to ensure product integrity during delivery. Plexus preapproval will be needed when it is specifically stated or agreed upon in the comments.
All Regulatory Compliance requirements are tested and in compliance	Compliance testing report	<date>	YES	<Replace with Comment or None>	When regulatory compliance testing is required, a certificate along with test report must be included. Serial number, calibration test result, calibration date and calibration due date shall be provided. Choose No if this is not a required.
All Checking Aids used by the supplier are approved, documented and controlled	Aid used to check acceptance of the part	<date>	YES	<Replace with Comment or None>	Documentation for Checking Aids including photos and /or drawing should be provided. Choose No if this is not a required.
ZDPQ Material is completed and submitted as the Part is approved for use in production product	Part Qualification Approval report	<date>	YES	<Replace with Comment or None>	Supplier can use this form with approvals at the bottom or provide an alternate that includes a mechanism that shows all requirements are completed and pass the defined criteria. The entire package of qualification documents should be included.
Customer requirements or unverifiable processes are appropriately qualified	Special TMV IQ/OQ/PQ report as agreed	<date>	YES	<Replace with Comment or None>	Supplier, Plexus customer and Plexus SQE to determine and agree on the approach to be used of TMV, IQ/OQ/PQ or other verification practices to be used.Reference 10966 as needed. Describe details and specifics in the comments. Choose No if this is not a requied.
PO Requirements for parts shipped: Use only if needed to complement supplier Quality Control plan and to define requirements prior to and/or after the completed ZDPQ part qualification.	Assign Q-code	<date>	YES	<Replace with Comment or None>	Reference the q-code or specific requirements addressing the inspection criteria used for and shipments of Pre production parts and/or the sustaining shipments for the part number/s. This should also be addressed and complement the supplier's control plan.

Additional Comments

Part Qualification Plan Set up Approval				Part Qualification Plan Set up Approval			
Supplier Name	<replace with name>			Customer Name (if required)	<replace with name>		
Supplier Signature		Date	<date>	Customer Signature (if required)		Date	<date>
Plexus name (SQE)	<replace with name>			Other	<replace with name>		
Plexus Signature		Date	<date>	Other Signature		Date	<date>

PLEXUS

ZDPQ Part Approval Form

QUALITY Begins with ME | ZERO DEFECTS

Reference Only - please consult with the Plexus SQE to devise a part specific ZDPQ plan as needed.

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>

NOTE: The Columns A thru I are populated from the worksheet titled ZDPQ plan after it is completed and agreed upon.

Supplier Contact	<enter>	Plexus SQE	<enter>
Email Address	<enter>	Purchase Order Number	<enter>

Submission Requirement	Date Initiated	Review Date
<Select from list>	<enter>	<enter>

Requirement	Required Supplier Deliverable	Scheduled Completion Date	Required Element?	Original ZDPQ Plan Comments	Supplier Approved/Submitted Date	Plexus Approved Date	Additional Comments
1) Supplier engagement/kick off 2) Review part from a DFM standpoint 3) Establish and flow down ZDPQ req. 4) Establish understanding of the part and quality requirements by the supplier	ZDPQ Review	<date>	YES	<Replace with Comment or None>			
Risk inputs from product/Design are included in process design and ZDPQ plan	DFMEA chart or table	<date>	YES	<Replace with Comment or None>			
All parties have a complete understanding of the processes used to manufacture the parts	Manufacturing Diagram or flow chart	<date>	YES	<Replace with Comment or None>			
Risk inputs from Supplier's manufacturing process is included in process design and ZDPQ plan	PFMEA chart or table	<date>	YES	<Replace with Comment or None>			
Supplier has a frozen process with Control Points defined and documented	Control Plan	<date>	YES	<Replace with Comment or None>			
An appropriate Measurement System is used to verify control and compliance of the process and parts being produced	MSA Report	<date>	YES	<Replace with Comment or None>			
Evidence that all characteristics are within design specifications. Multi-piece FAI and tolerance limitations are used to indicate variation.	FAI/Dimensional Report	<date>	YES	<Replace with Comment or None>			
Plexus to have samples parts provided for reference and additional verification	Master Sample parts	<date>	YES	<Replace with Comment or None>			
All raw, purchased, assembly materials and outside process are in compliance with the specifications	Material Certification Report	<date>	YES	<Replace with Comment or None>			
Use only Qualified Laboratories for internal and external testing	Certification Report for Laboratories	<date>	YES	<Replace with Comment or None>			
Cosmetic/Appearance quality	Appearance Report	<date>	YES	<Replace with Comment or None>			
Demonstrated Process Control	Report with capability studies and applicable statistics	<date>	YES	<Replace with Comment or None>			
Product to be appropriately protected, shipped and available for depacking	Packaging Plan	<date>	YES	<Replace with Comment or None>			
All Regulatory Compliance requirements are tested and in compliance	Compliance testing report	<date>	YES	<Replace with Comment or None>			
All Checking Aids used by the supplier are approved, documented and controlled	Aid used to check acceptance of the part	<date>	YES	<Replace with Comment or None>			
ZDPQ Material is completed and submitted as the Part is approved for use in production product	Part Qualification Approval report	<date>	YES	<Replace with Comment or None>			
Customer requirements or unverifiable processes are appropriately qualified	Special TMV IQ/OQ/PQ report as agreed	<date>	YES	<Replace with Comment or None>			
PO Requirements for parts shipped: Use only if needed to complement supplier Quality Control plan and to define requirements prior to and/or after the completed ZDPQ part qualification.	Assign Q-code	<date>	YES	<Replace with Comment or None>			

Comment Summary

The Suppliers Approval below designates that the ZDPQ plan has be fully executed and meets the requirements and documentation as previously agreed. The Plexus SQ approval designates the review and approval of the ZDPQ plan for Production release. All exceptions, waivers or deviations must be included and referenced (if an external document) above in the Comment Summary.

Part Qualification Approval					Part Qualification Plan Set up Approval			
Supplier Name	<replace with name>			○ Approved	Customer Name (if required)	<replace with name>		
Supplier Signature		Date	<date>	○ Rejected ○ Conditionally Approved	Customer Signature (if required)		Date	<date>
Plexus name (SQE)	<replace with name>				Other	<replace with name>		
Plexus Signature		Date	<date>		Other Signature		Date	<date>

ZDPQ Review Meeting

This template is provided as a tool to prepare records of the ZDPQ Review Meeting. This form may used reference or as a formal record of the ZDPQ Review Meeting.

		Date of Review	<enter>
Part Number	<enter>	Recorded by	<enter>
Drawing Number	<enter>		
Supplier Name	<enter>		
Customer Name	<enter>		

Name	In Attendance:	Job Title

Name	Absent:	Job Title

For absent team members, the minutes of this meeting must be sent to them afterwards, and opportunity for review and comment given. Any comments, changes, or additional inputs from these individuals must be incorporated into the final minutes or issued as an addendum

Meeting Agenda

Item 1: Review of the Plexus and Customer's Quality Policy and the purpose for Zero Defect Part Qualification

☐ Accepted
☐ Declined/Needs Revision

Comments:

Item 2: If current supplier, review any open quality items that may affect production of new products (i.e., scorecard, NCMs,

☐ Accepted
☐ Conditionally Accepted
☐ Declined/Needs Review

Comments:

Item 3: Flow down of requirements - this will include items such as the Plexus/customer part quality requirements, completed customer expectations checklist and qualification plan from the ZDL process (form 14388), such as part approval requirements, customer PPAP, critical characteristics, inspection requirements, etc. *See tabs ZDPQ Plan and Design*

☐ Accepted
☐ Declined/Needs updates

Comments:

Item 4: List items to follow-up for next meeting

1
2
3
4
5
6
7
8

This acts as an agreement between parties for the above items discussed to drive a zero defect effort for this project launch

Process Flow Diagram

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking Code	<enter>

Note: Define the process flow diagram for the parts by selecting the step coresponding activity in column B in the order of events.

Additionally, if you have a predefined internal form for the process flow that can be pasted in this sheet as a replacement of this template. In that case only fill out the header section of the form (rows 2 to 8)

Date	<enter>	Submitted by	<enter>

Legend

Internal Operation	
External Operation	
Inspection/Test	
Report Generation	
Transport	
Storage	
Other	

Step ID	Event Type	Description of Event	Description of Control or Evaluation	Reflected to pFMEA/CP?
1	Transport			
2	Transport			
3	Inspection/Test			
4	Storage			
5	Transport			
6	Internal Operation			
7	Inspection/Test			
8	Internal Operation			
9	Inspection/Test			
10	Internal Operation			
11	Transport			
12	Storage			
13	Inspection/Test			
14	Transport			
15	Internal Operation			
16	Inspection/Test			
17	Storage			
18	Transport			
	Other			
	Other			

Design Requirements Review

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>

Attendees		DRR Checklist			
Company/Job Title	Name	Drawings provided prior to the review	☐	Material and Finishes	☐
		Latest print revision	☐	Critical to Quality (CTQ)/Critical to Safety (CTS)?	☐
		Purpose and functionality	☐	Open design changes	☐
		Specifications and tolerances	☐	Special Packaging	☐
		Risks addressed	☐	Tooling, check aids, fixtures	☐
		Notes denoted on drawings	☐	Q-Codes /PPAP requirements	☐
		Items/Specifications Reviewed:			

Item #	Specification Reviewed	Drawing/Spec Location	Supplier Understands?	Change Needed?	Action Owner	Completion Date	Notes/Comments
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Design FMEA

Plexus SQE or team to add a copy of the DFMEA below or provide a copy to the supplier when it is available.

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>

Process Failure Mode and Effects Analysis

Part Number	<enter>	Part Description	<enter>	Reference AIAG Fourth Edition http://www.aiag.org/ for additional information on FMEA	Date of Review <enter>
Drawing Number	<enter>	Part Revision	<enter>		Prepared By <enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>		PFMEA number <enter>

Process Step / Requirements	Potential Failure Mode	Potential Effect(s) of Failure	Severity	Class	Potential Cause(s) / Mechanism(s) of Failure	Occurrence	Current Process Controls Prevention	Current Process Controls Detection	Detection	R.P.N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Results: Actions Taken & Completion Date	Severity	Occurrence	Detection	R.P.N.
Name, Part Number, or Class Function	Manner in which part could fail: cracked, loosened, deformed, leaking, oxidized, etc.	Consequences on other systems, parts, or people: noise, unstable, inoperative, impaired, etc.			List every potential cause and/or failure mechanism: incorrect material,		List prevention activities to assure process adequacy and prevent or reduce	List detection activities to assure process adequacy and prevent or reduce			Design actions to reduce severity, occurrence and detection ratings. Severity of 9 or 10 requires special attention.	Name of organization or individual and target completion date	Actions and actual completion date				
										0							0
										0							0
										0							0
										0							0
										0							0
										0							0
										0							0
										0							0

Severity of Effect:	
No Effect	1. None
Annoyance	2. Very Minor 3. Minor 4. Very Low
Loss or degradation of secondary function	5. Low 6. Moderate
Loss or degradation of primary function	7. High 8. Very High
Failure to meet safety/regulations	9. Hazardous with warning 10. Hazardous w/o warning

Occurrence Rating
1. Very low <.01/1000, (Cpk > 2.0)
2. Low - 1/1000000, (Cpk ~ 2.0)
3. Low - 1/100000, (Cpk ~ 1.67)
4. Moderate - 1/10000, (Cpk ~ 1.33)
5. Moderate - 1/2000, (Cpk ~ 1.17)
6. Moderate - 1/500, (Cpk ~ 1.0)
7. High - 1/100, (Cpk ~ 0.83)
8. High - 1/50, (Cpk ~ 0.67)
9. Very High 1/20, (Cpk ~ 0.33)
10. Very High >1/10, (Cpk < 0.33)

Detection:
1. Almost Certain
2. Very High
3. High
4. Moderate High
5. Moderate
6. Low
7. Very Low
8. Remote
9. Very Remote
10. Almost Impossible

Stakeholder	Effects of Failure	Severity
Consumer (e.g., buyer)	Owner Safety Problem	10
	Major Owner Dissatisfaction	8
	Moderate Owner Dissatisfaction	6
	Minor Owner Dissatisfaction	4
Customer (Manufacturer)	Plant Safety Problem	10
	Possible Recall	9
	Line Stoppage	8
	Warranty Costs	7
AIAG PPAP 4th	Scrap	7
	Regulatory Penalty	7
	Moderate Rework (<25%)	5
	Plant Dissatisfaction	4
	Minor Rework (<10%)	3

Control Plan

Part Number	<enter>	Part Description	<enter>	Control Plan #	<enter>
Drawing Number	<enter>	Part Revision	<enter>	Prepared by:	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>	CP Date:	<enter>
Supplier Location	<enter>			Person Responsible	<enter>

Part/Process Number	Process Name / Operation Description	Process Detail & Operations	Product/Process Specification Tolerance	Product	IM&T Check / Method	Size	Frequency / Analysis Method	Control Method / Record Method	Trigger Point	Reaction Plan	Responsibility / Check Person	Relevant Standard

PLEXUS

MSA-Data Entry

Part Number	<enter>	Part Description	<enter>
Feature Name	<enter>	Feature Description	<enter>
Feature Tolerance	<enter>	Completed By	<enter>
		Study Date	<enter>

p-Value for Interaction: 0.25 *(default is 0.25)*

Notes:
(1) all calculations in this workbook have been validated using AIAG standards with ten parts, three appraisers, and three trials.
(2) all measurement data (ten parts, three appraisers, three measurements each) must be entered to obtain valid results.

Appraiser	Trial #	Part 1	2	3	4	5	6	7	8	9	10	Average
Appraiser A	1											#DIV/0!
	2											#DIV/0!
	3											#DIV/0!
	Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Range	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Appraiser B	1											#DIV/0!
	2											#DIV/0!
	3											#DIV/0!
	Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Range	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Appraiser C	1											#DIV/0!
	2											#DIV/0!
	3											#DIV/0!
	Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Range	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Part Average		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.000

For Calculation Purposes Only - Not Part of Data Input Sheet

$(x_i - x_{avg})^2$ Values

Appraiser Name	Trial #	Part 1	2	3	4	5	6	7	8	9	10	
Appraiser A	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Avg From Above		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
$(Avg - x_{avg})^2$		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**
Appraiser B	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Avg From Above		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
$(Avg - x_{avg})^2$		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**
Appraiser C	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Avg From Above		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
$(Avg - x_{avg})^2$		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**

Tabulated ANOVA Results With Interaction

Variation Source	DF	SS	MS	F	P Value
Appraiser	3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Parts	9	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interaction	18	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Repeatability	60	#DIV/0!	#DIV/0!		
Total	89	0.000			

Gage R&R With Interaction

	Estimate of Variance	Std Dev	Study Variation (6σ)	% Study Variation	% Cont
Repea	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Reproi	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Accri	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Intera	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
GR&R	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Part	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

AIAG MSA 3rd Edition, Page 187:
"Since each mean square is a simple quantity subject to sampling variation and the computations involve differences of mean squares, then negative variance components are possible. This is a bit of a problem since the "master" variance components are equal or close to zero or have a small sample size. For analysis purposes, the negative variance component is set to zero."

Tabulated ANOVA Results Without Interaction

Variation Source	DF	SS	MS	F	P Value
Reproducibility	3	#DIV/0!	#DIV/0!	#DIV/0!	*
Parts	9	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Repeatability	78	#DIV/0!	#DIV/0!		
Total	89	#DIV/0!			

Gage R&R Without Interaction

	Estimate of Variance	Std Dev	Study Variation (6σ)	% Study Variation	% Cont
Repea	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Reproi	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
GR&R	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Part	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

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MSA-Report

Part Number	<enter>	Part Description	<enter>
Feature Name	<enter>	Feature Description	<enter>
Feature Tolerance	<enter>	Completed By	<enter>
		Study Date	<enter>

Summary Results

	% Study Variation	% Tolerance
Total Gage R&R	#DIV/0!	
Repeatability	#DIV/0!	
Reproducibility	#DIV/0!	
Part-to-Part	#DIV/0!	

Two-Way ANOVA Table With Interaction

	DF	SS	MS	F	P Value	
Part	9	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Appraiser	3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Appraiser-Part Interaction	18	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	*Interaction will be included if p value is less than (reference "p-Value for Interaction" input on Data Entry page)*
Equipment	60	#DIV/0!	#DIV/0!			
Total	89	0.000				

Two-Way ANOVA Table Without Interaction

	DF	SS	MS	F	P Value
Part	9	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Appraiser	3	#DIV/0!	#DIV/0!	#DIV/0!	*
Equipment	78	#DIV/0!	#DIV/0!	-	
Total	89	#DIV/0!			

Gage R&R

Source	Variance Component	% Contribution
Total Gage R&R	#DIV/0!	#DIV/0!
Repeatability	#DIV/0!	#DIV/0!
Reproducibility	#DIV/0!	#DIV/0!
Appraiser	#DIV/0!	#DIV/0!
Appraiser-Part	#DIV/0!	#DIV/0!
Part-to-Part	#DIV/0!	#DIV/0!
Total Varation	#DIV/0!	#DIV/0!
Number of Distinct Categories	#DIV/0!	

Pie Chart - Variance Components

Source	Standard Deviation	Study Variation (6s)	% Study Variation	% Tolerance
Total Gage R&R	#DIV/0!	#DIV/0!	#DIV/0!	
Repeatability	#DIV/0!	#DIV/0!	#DIV/0!	
Reproducibility	#DIV/0!	#DIV/0!	#DIV/0!	
Appraiser	#DIV/0!	#DIV/0!	#DIV/0!	
Appraiser-Part	#DIV/0!	#DIV/0!	#DIV/0!	
Part-to-Part	#DIV/0!	#DIV/0!	#DIV/0!	
Total Varation	#DIV/0!	#DIV/0!	#DIV/0!	

For Calculation Purposes Only - Not Part of Gage R&R Printout

Results based on Part-by-Appraiser Interaction Significance

	Estimate of Variance	Standard Deviation (s)	Study Variation (6s)	% Total Study Variation	% Contribution
Repeatability	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Appraiser	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Parts	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

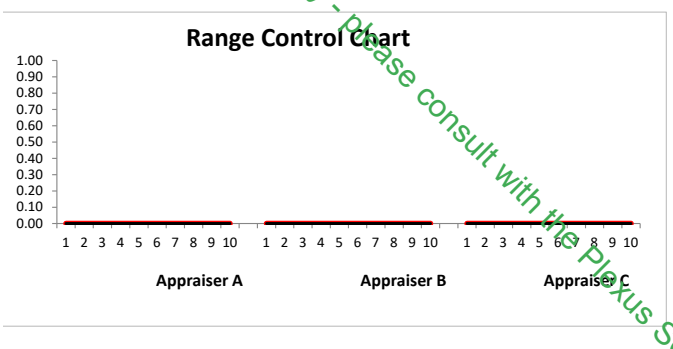
Untruncated Distinct Categories Value #DIV/0!

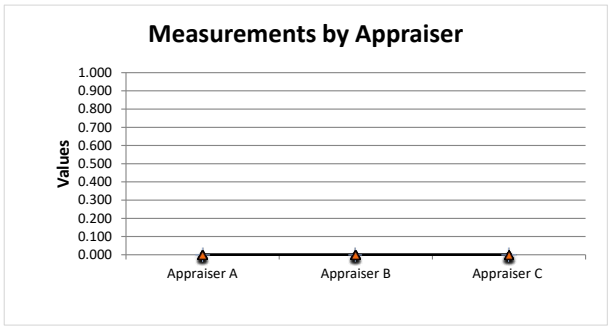
MSA Results - ANOVA Method

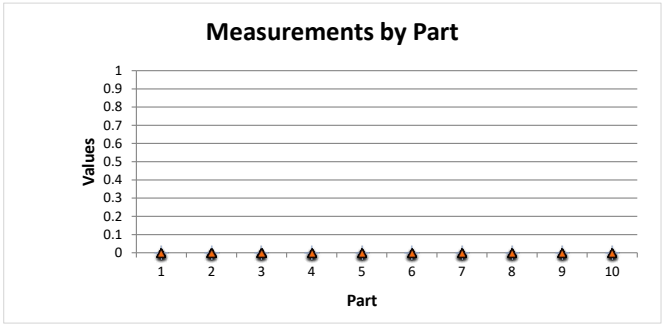
Calculations per AIAG MSA Manual, Third and Fourth Editions

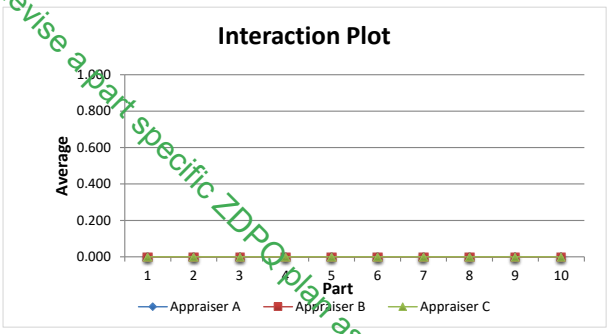
Study Information

Supplier Contact	<enter>	Plexus SQE	<enter>
Feature Name	<enter>	Feature Description	<enter>
Feature Tolerance	<enter>	Completed By	<enter>
		Study Date	<enter>









First Article/Dimensional Report

Part Number	<enter>	Part Description	<enter>	FAIR #	<enter>
Drawing Number	<enter>	Part Revision	<enter>	Prepared by:	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>	FAIR Date:	<enter>
Supplier Location	<enter>			Person Responsible	<enter>
Supplier Contact	<enter>	Plexus SQE	<enter>		
Email Address	<enter>	Purchase Order Number	<enter>		

Customer Name	<optional>	Cavities/Number of pieces per tool	<optional>
Customer MPF	<optional>	Estimated Run Size	<optional>
Project/Program	<optional>		
Commodity	<optional>		
Date Code	<enter as needed>		
Deviation	<enter as needed>		
Q-code	<enter as needed>		
Drawing revision	<enter as needed>		

PART ONE : GENERAL DIMENSIONAL VERIFICATION

NO	DIMENSION			TOLERANCE		RANGE		SAMPLE NO					STATUS		EQP	REMARK
	Item identifier / zone reference	Nominal	UOM	+	-	MIN	MAX	1	2	3	4	5	PASS/ FAIL	N/A		
1	*sample1*	*2.000*	*MM*	*2*	*1*	*1*	*4*	*1*	*2*	*2*	*2*	*2*	*PASS*		*PP*	*good*
2	sample2	2.000	MM	2		1	4	2	4	5	4.5	3	*FAIL*		QV	2 pieces where OOT
3						N/A	N/A	N/A	N/A	N/A	N/A	N/A	*N/A*	X		
4						N/A	N/A	N/A	N/A	N/A	N/A	N/A	*N/A*	X		
5						N/A	N/A	N/A	N/A	N/A	N/A	N/A	*N/A*	X		
6						N/A	N/A	N/A	N/A	N/A	N/A	N/A	*N/A*	X		
7						N/A	N/A	N/A	N/A	N/A	N/A	N/A	*N/A*	X		
8						N/A	N/A	N/A	N/A	N/A	N/A	N/A	*N/A*	X		
9						N/A	N/A	N/A	N/A	N/A	N/A	N/A	*N/A*	X		
10						N/A	N/A	N/A	N/A	N/A	N/A	N/A	*N/A*	X		

Measuring Equipment used (EQP) : PP = PROFILE PROJECTOR; CMM = COORDINATE MEASURE MACHINE; QV = QUICK VISION; CAL = CALIPER; MC = MICROMETER; SR = STEEL RULER; MT = MEASUREMENT TAPE; GSP = GRANITE SURFACE PLATE; HG = HEIGHT GAUGE; PG = PIN GAUGE; TPG = THRUTHTHREAD PLUG GAUGE; BG = BLOCK GAUGE; RG = RADIUS GAUGE; LCR = LCR METER; MM = MULTIMETER; MS = MICROSCOPE; DI = DIGIMATIC INDICATOR ; FG = FEELER GAUGE ; XRF = X-RAY FLUORESCENCE; SS = SMART SCOPE; VMS = VIDEO MEASURING SYSTEM ; OSS = OGP SMART SCOPE;

Equipment Name	Equipment No.	Next Calibration Due Date	Equipment Name	Equipment No.	Next Calibration Due Date

PART TWO : GEOMETRIC, DIMENSION AND TOLERNCING, PLUS FEATURE CONTROL FRAME VERIFICATION

NO	DIMENSION				TOLERANCE		RANGE		SAMPLE NO					STATUS		EQP	REMARK
	Item identifier / zone reference	Characteristic / Description	Nominal	UOM	+	-	MIN	MAX	1	2	3	4	5	PASS/ FAIL	N/A		
1							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		
2							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		
3							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		
4							N/A	N/A	N/A	N/A	N/A	N/A	N/A				
5							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		
6							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		
7							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		
8							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		
9							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		
10							N/A	N/A	N/A	N/A	N/A	N/A	N/A		X		

Characteristic/ Description
Orientation: a = a, Angularity, b = b, Perpendicularity, f= f, Parallelism
Form: c= c, Flatness, e= e, Circularity, g= g, Cylindricity, u = u, Straightness
Profile: d= d, Profile of a surface, k= k, Profile of a line
Location: i= i, Symmetry, j= j, Position, r= r, Concentricity
Run-out: h= h, Circular Run-Out, t = t, Total Run-Out
Feature Control Frame: l= l, Least Material Condition, m= m, Maximum Material Condition, p= p, Projected Tolerance Zone, s= s, Regardless of Feature Size

Measuring Equipment used (EQP) : PP = PROFILE PROJECTOR; CMM = COORDINATE MEASURE MACHINE; QV = QUICK VISION; CAL = CALIPER; MC = MICROMETER; SR = STEEL RULER; MT = MEASUREMENT TAPE; GSP = GRANITE SURFACE PLATE; HG = HEIGHT GAUGE; PG = PIN GAUGE; TPG = THRUTHTHREAD PLUG GAUGE; BG = BLOCK GAUGE; RG = RADIUS GAUGE; LCR = LCR METER; MM = MULTIMETER; MS = MICROSCOPE; DI = DIGIMATIC INDICATOR ; FG = FEELER GAUGE ; XRF = X-RAY FLUORESCENCE; SS = SMART SCOPE; VMS = VIDEO MEASURING SYSTEM ; OSS = OGP SMART SCOPE;

Equipment Name	Equipment No.	Next Calibration Due Date	Equipment Name	Equipment No.	Next Calibration Due Date

PART THREE: NOTES & VISUAL VERIFICATION (where Applicable)

☐ Not Applicable

		STATUS			REMARK
		PASS	FAIL	N/A	
1					
2					
3					
4					
5					
6					
7					
8					
9					

PART FOUR: SHELF LIFE VERIFICATION (where Applicable)

☐ Not Applicable

Manufacture	Shelf Life	Manufacturing date	Expiry Date	STATUS	REMARK

Comments:

FAIR Approval			FAIR Status			
Inspector Name		Date	○ Approved	Approved by		Date
Signature			○ Rejected	Signature		
			○ Conditionally Approved			
Verified By		Date				Date
Signature						

Note: If there is any modification of formulas in this form, it needs to be explained in the "Remark" column.

Master Sample Instruction

The organization shall retain a master sample for the same period as the production part approval records, or (A) until a new master sample is produced for the same customer part number for customer approval, or (B) where a master sample is required by the design record, Control Plan or inspection criteria, as a reference or standard. The master sample shall be identified as such, and shall show the customer approval date on the sample. The organization shall retain a master sample for each position of a multiple cavity die, mould, tool or pattern, or production process, unless otherwise specified by the customer."

NOTE 1: When part size, sheer volume of parts, etc. makes storage of a master sample difficult, the sample master retention requirements may be modified or waived in writing by the authorized customer representative. The purpose of the master sample is to assist in defining the production standarrd, especially where data is ambiguos or insufficient detail to fully replicate the part to its original approved state.

NOTE 2: Many bulk material properties are by their nature time dependent, and if a master sample is required, it may consist of the manufacturing record, test results, and certificate of analysis of key ingredients, for the approved submission sample (see Appendix F).

Material Certification

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>

No	Material name/Type	Material Certification Provided?	If no, please provide justification
1			
2			
3			

Remark:

Attach material test reports for the material used to part and complete the Part Qualification. The material report must include specifics for all materials used. A material test report shall be included but not limited below contents:

- Testing date
- Material name/type
- Material batch#
- Testing Qty
- Material character/parameter specification/standard
- Character/parameter test data/result
- Final conclusion
- signature/testing lab stamp

Laboratory Certification

Part Number	*<enter>*	Part Description	*<enter>*
Drawing Number	*<enter>*	Part Revision	*<enter>*
Supplier Name	*<enter>*	Ref. Tracking code	*<enter>*
Ref. Tracking code	*<enter>*	Certification Report Number	*<enter as needed>*
External laboratories used?	no	Attach the Certification report below	
Internal laboratories used?	no		

Remark: For External Testing Laboratories the certification should accreditate to ISO/IEC 17025 or an equivalent standard. These will typically have a certificate number such as CNSXXX.

PLEXUS

Appearance Approval Report

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>
Supplier Location	<enter>		
Supplier Contact	<enter>	Plexus SQE	<enter>
Email Address	<enter>	Purchase Order Number	<enter>

COLOR EVALUATION

Color #	Color Description	Specification			Measurement			Customer Comments	Approval Status		Customer Initials
		L	a	b	L	a	b		A	R	
								☒ NOT REQ'D ☐ REQ'D			

Note: The columns below are for reference only, and must be customized for individual components and their requirements

COSMETIC DEFECTS EVALUATION

Area of Inspection	Acceptance Criteria	Evaluation Method	Limit Acceptable	Limit Unacceptable
	Top Gap max 0.3mm, Side gap max 0.4mm, Bottom gap max 0.5mm	Feeler Gauge	x	x
	Even Gap	Visual		
Straigtness: Top Edge	Variation from Flat Max 1mm	Dimensional, gauge	1.0 mm variation is ok	1.1 mm
Straightness: Sides	Max Variation from Flat Max 1.5 mm	Dimensional, gauge	1.5 mm	1.6mm
Straightness: Bottom Edge	Variation from Flat Max 3mm	Dimensional, gauge	3.0 mm	3.1 mm
Appearance Defects: Front Surface	Class A Surface	Visual - Arms Length (refer to Note #1)	Surface scratches at one location only must not exceed 7mm in length.	
			Surface scuffs at one location only must not exceed 7mm in diameter.	
Appearance Defects: Side Surfaces and Top Surface	Class B Surface	Visual - Arms Length (refer to Note #1)	**LIMIT ACCEPTABLE IS 12 POINTS**	
			Points / Ding/Dirt Max / Discolored Scratch / Surface Scratch	
			15 / 5mm / 15+ mm / 20-30mm	
			8 / 4mm / 10-15mm / 15-20mm	
			4 / 3mm / 5-10mm / 10-15mm	
			2 / 2mm / 3-5 mm / 5-10mm	
			1 / 1mm / 1-3mm / 3-5mm	
Appearance Defects: Bottom Surface	Class C Surface	Visual - Arms Length (refer to Note #1)	**LIMIT ACCEPTABLE IS 20 POINTS**	
			Points / Ding/Dirt Max / Discolored Scratch / Surface Scratch	
			15 / 5mm / 15+ mm / 20-30mm	
			8 / 4mm / 10-15mm / 15-20mm	
			4 / 3mm / 5-10mm / 10-15mm	
			2 / 2mm / 3-5 mm / 5-10mm	
			1 / 1mm / 1-3mm / 3-5mm	
			LIMIT ACCEPTABLE IS 12 POINTS	
			15 / 5mm / 15+ mm / 20-30mm	
			8 / 4mm / 10-15mm / 15-20mm	
			4 / 3mm / 5-10mm / 10-15mm	
Riveting	Gap from Rivet to Cover cannot exceed 0.30mm	Feeler Gauge		
Lid Front and Back Part	Gap from Bezel to Cover cannot exceed 0.40mm	Feeler Gauge		
Lid Right Side and Left Side Part	Lens must be completely free of visible scratches and all 6 tabs must be 100% engaged	Visual Self on Assembly Line	Arms Length and 5 seconds nothing visible	
Brushing	Variation from Reference Standard	Visual	Arms Length and 5 seconds nothing visible	
Stains, grease, finger marks	Class A Surface	Visual - Arms Length (refer to Note #1)	No defects visible at arms length	Any defects visible at arms length
Bumps, wave	Class A Surface	Visual - Arms Length (refer to Note #1)	No defects visible at arms length	Any defects visible at arms length
Bumps, wave	Class B and C Surfaces	Visual - Arms Length (refer to Note #1)	Per approved Master Sample	
Graphics Appearance	Variation from Reference Standard	Visual - Arms Length (refer to Note #1)	No missing printing, no missing ink, no missing filling of pictograms	
Graphics Appearance	Variation from Reference Standard	Visual - Arms Length (refer to Note #1)	No misalignement of pictograms	
Graphics Appearance	Variation from Reference Standard	Visual - Arms Length (refer to Note #1)	Regular and homogenous colour	

Comments:

Supplier Signature:	Supplier Name:	Date:	Customer Signature:	Date

Note #1 - Part is visually inspected for 5 seconds, straight at arms length without tilting Cover.

Capability Study

Commonly used Capability Indices require a process to be stable, in control and follow a normal distribution. There are many tools available to help create and execute either a variable or attribute Capability study. It is recommended that the supplier use a software such as Minitab to evaluate and calculate Capability. Other tools and other low cost tools like Excel can also be used to analyze and report the results. All calculation should use the following formulas as appropriate. It is preferred that control charts, histograms, normality tests and the Cp/Cpk results are included with the results.

The completed results can be copied and pasted into this worksheet.

Formulae for on-going capability

Potential $C_p = \dfrac{USL - LSL}{\left[6 \times \dfrac{\overline{R}}{d_2}\right]}$

Capability

$C_{pk} = \text{minimum}(C_{pu}, C_{pl})$ where

$C_{pu} = \dfrac{USL - \overline{X}}{3 \times \left(\dfrac{\overline{R}}{d_2}\right)}$ and $C_{pl} = \dfrac{\overline{X} - LSL}{3 \times \left(\dfrac{\overline{R}}{d_2}\right)}$

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Formulae for preliminary capability

Potential $P_p = \dfrac{USL - LSL}{6 \times \sigma}$

Capability

$P_{pk} = \text{minimum}(P_{pu}, P_{pl})$ where

$P_{pu} = \dfrac{USL - \overline{X}}{3 \times \sigma}$ and $P_{pl} = \dfrac{\overline{X} - LSL}{3 \times \sigma}$

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Packaging Approval Form

Single Part Information	
Project Name	Ref Tracking No.
	<enter>
Package Owner	Supplier Location
Parts Package Type	

General Information		
Part Number	Part Name	Package Level
Batch/kitting Package Type		

Package and Transport	
Transport	Pallet Recycle
Loading Method	Package Recycle
Package Type	

Single Part Packaging	
Insert Photo	
Package Drawings	
Dimensions(mm).	
Proof Test	
Gross Weight	
Description	

Layered or cell	
Insert Photo	
Package Drawings	
Dimensions(mm).	
Gross Weight	
Part quantity	
Description	

Shipping Configuration	
Insert Photo	
Package Drawings	
Dimensions(mm).	
Proof Test	
Quantity/Pallet	
Description	

Comments

Comments

Comments

Supplier Representative

Name	Title	Phone Number

Supplier Signature: _____ Date: _____

Regulatory Compliance Testing Report

Part Number	<enter>	Part Description	<enter>
Drawing Number	<enter>	Part Revision	<enter>
Supplier Name	<enter>	Ref. Tracking code	<enter>
Supplier Location	<enter>		
Supplier Contact	<enter>	Plexus SQE	<enter>
Email Address	<enter>	Purchase Order Number	<enter>

External laboratories used?	<enter>	Attach the Certification report below
Internal laboratories used?	<enter>	

Remark: For External Laboratories the certification should accreditate to ISO/IEC 17025 or an equivalent standard.