

Special Process: Plating System Assessment Cover Sheet			
Facility Name: Elm Plating Company			
Address: 1319 Elm Street, Jackson MI, 49203			
Phone Number: 517-782-8161			
Current Quality Certification(s):IATF-16949, ISO-17025, I	SO-14001		
Number of Plating Employees at this Facility: 56 Hourly E	mployees 21 Salary Employees Total 77		
Captive Plater (Y/N): NO			
Commercial Plater (Y/N): Yes			
Date of Assessment: May 19th 2023			
Date of Previous Assessment: May 19th 2022			
Date of Re-assessment (if necessary):			
Type(s) of	f Plating Processing at this Facility:		
Process Table A:	Process Table F: Not Applicable		
Zinc- Yes, Chloride Acid Zinc	Hard Chrome Plating		
Zinc Alloy Plating			
Process Table B: Not Applicable	Process Table G: Not Applicable		
Mechanical Plating	Electroless Nickel		
Process Table C: Not Applicable	Process Table H: Yes- per Customer Requirements		
Decorative Plating of Metal Substrates	Hydrogen Embrittlement Relief Process		
Process Table D: Not Applicable	Process Table I: Yes- Per Customer Requirements		
Decorative Plating of Plastic Substrates	Process Control and Testing Equipment Verification and Calibration		
Process Table E: Not Applicable			
Electropolish and Chrome Flash			
Personnel Contacted:			
Name:	Phone:		
Jonas McCluskey	517-782-8161		
Lenny Duff	517-782-8161		
Sam Bitonti	517-782-8161		
Gary Amrhein	517-782-8161		
Natalie Glisson	517-782-8161		
Auditors/Assessors:			
Name:	Phone:		
Tricia McArthur	517-782-8161		
Bill Dunn	517-782-8162		
<u> </u>			
Number of Nonconforming Findings from Section 1 and S	ection 2: None		
<u> </u>	0		
Number of Nonconforming Findings in the Job Audit(s): N	lone		
0			
Number of Nonconforming Findings in the Process Table	(s): None		
0			



#### Section 1 - Management Responsibility & Quality Planning

1.1

There shall be a dedicated and qualified surface finishing person on site.

• To ensure readily available expertise, there shall be a dedicated and qualified surface finishing person on site.

• This individual shall be a full-time employee and the position shall be reflected in the organization chart.

• A job description shall exist identifying the qualifications for the position including chemical and surface finishing/surface finishing knowledge.

• The qualifications shall include a minimum of 5 years' experience in surface finishing operation or a combination of a minimum of 5 years of relevant formal education and surface finishing experience.

Guidance	Objective Evidence	Conforming Nonconforming NA
What is this person's title?	Director of Technical Engineering- 15 Years Experience Please see attached Organization Chart. Job Description Attached	Conforming
Is this position reflected in the organizational chart?	Yes	Conforming
Is there a documented job description listing all the required qualifications and responsibilities of this position?	Yes HRJD-0056	Conforming
Describe in detail this person's educational background and practical experience.	Bachelors from Michigan State University, 15 years Experience.	Conforming
How many years of process experience at a plating facility does this person have?	15 Years	Conforming
Is this individual a full-time employee at the location being audited?	Yes, full time Employee located at 1319 Elm Street.	Conforming

Comments:

1.2

Please see attached Documentation

#### Section 1 - Management Responsibility & Quality Planning

The facility shall perform advanced quality planning.

• The organization shall incorporate a documented advanced product quality planning process.

• A feasibility study shall be performed and internally approved for each new part or process. Similar parts can be grouped into part families for this effort as defined by the organization.

• After the part approval process is approved by the customer, no process changes are allowed unless approved by the customer.

• The organization shall contact the customer when clarification of process changes is required. This clarification of process changes shall be documented.

Guidance	Objective Evidence	Conforming Nonconforming NA
Does the facility use a documented advanced quality planning process?	Procedure # PR-200 for advanced quality planning including process changes. Planning documented on QCT4-0007	Conforming
Does the facility perform a documented internal feasibility study for each part before processing? If no, does the facility perform a documented internal feasibility study for similar part types or family of parts before processing?	Documented on form # QCT4-0007 and recipe matrix data/ feasibility	Conforming
What is the procedure for changing the process after PPAP?	See procedure # PR-200 section 5.0 and plan documented on form # QCT3-0009	Conforming
Comments: Please see attached Documentation		



	Section 1 - Management Responsibility & Quality Planning				
1.3	The facilities FMEAs shall be up to date and shall reflect the current process.				
• The • The • FME • A cro • All s	<ul> <li>The organization shall incorporate the use of a documented Failure Mode and Effects Analysis (FMEA) and ensure the FMEAs are updated to reflect current part quality status.</li> <li>The FMEA shall be written for each part or part family or they may be process-specific and written for each process.</li> <li>FMEAs shall address every process step from part receipt to part shipment.</li> <li>A cross-functional team shall be used in the development of the FMEA.</li> <li>All special characteristics, as defined by the organization and its customers, shall be identified, defined, and addressed in the FMEA.</li> </ul>				
	Guidance Conforming Nonconforming Nonconforming Nonconforming Nonconforming Nonconforming Nonconforming NA				
Does t	Does the facility have a documented Failure Mode and Effects Analysis (FMEA) in use? Yes, PFMEA'S for all Processing Lines		Conforming		
Identi	Tricia McArthur- Quality Manager Lenny Duff- VP of Sales Sam Bitonti- VP of Plating Sean Peck- Director of Technical Engineering Walt Wingfield- Maint. Manager Dave Foster- Production Manager		Conforming		
Identi	if the FMEA is written for each part, part family or process specific.	Process Line Specific	Conforming		
Are all	FMEAs consistent with all associated documentation such as control plans, work instructions and shop travelers?	Yes and match Control Plans which reference other work instructions and job routers.	Conforming		
Do all	MEAs include every process step from part receipt to part shipment?	Yes	Conforming		
Are sp	cial characteristics, as defined by the organization and its customers, identified, defined, and addressed in the FMEAs?	On Part Specific Job routers as listed in PR-200	Conforming		
Provid	e evidence that the FMEA has been updated in response to quality issues.	See actions taken and updated RPN per new revisions.	Conforming		
Comm Please	Comments: Please see attached Documentation				

## AIAG

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	Section 1 - Management Responsibility & Quality Planning
1.4	The process control plans shall be up to date and shall reflect the current process.

The organization shall incorporate the use of a documented control plan and ensure the control plans are updated to reflect current controls.

• The control plans shall be written for each part or part family or they may be process-specific.

• The control plans shall address all process steps from part receipt to part shipment and identify all equipment used and all key surface finishing process parameters as defined by the organization.

• A cross-functional team shall be used in the development of control plans, which shall be consistent with all associated documentation such as work instructions, shop travelers, and FMEAs.

• All special characteristics, as defined by the organization and its customers, shall be identified, defined, and addressed in the control plans.

• The control plan shall detail the product and process characteristics, and controls including testing frequency and sample size.

Guidance	Objective Evidence	Conforming Nonconforming NA
Does the facility have a documented control plan in use?	Yes, Process Line Specific	Conforming
Identify if the control plan is written for each part, part family or process specific.	Process Line Specific	Conforming
Do all control plans include every process step from part receipt to part shipment?	Yes, See attached	Conforming
Does the control plan identify all key surface finishing process parameters?	Yes, See attached	Conforming
Identify the names and job function of the team members used in the development of the control plan.	Tricia McArthur- Quality Manager Lenny Duff- VP of Sales Sam Bitonti- VP of Plating Sean Peck- Director of Technical Engineering Walt Wingfield- Maint. Manager Dave Foster- Production Manager	Conforming
Are the control plans consistent with all associated documentation such as work instructions, shop travelers, specifications and FMEAs?	Yes - Control plan is process specific / specification specific and includes all steps.	Conforming
Provide evidence that sample sizes and frequencies for evaluation of process and product characteristics are addressed and consistent with the minimum requirements.	3pcs from each barrel at processing line. 20 pc minimum at Final Inspection, Certs provided with each shipment	Conforming
Are special characteristics, as defined by the organization and its customers, identified, defined, and addressed in the control plans?	On Part Specific Job routers as listed in PR-200	Conforming
Provide evidence that the control plan has been updated in response to quality issues, customer requirements and process changes.	See actions taken and updated Rev.	Conforming
Comments: Please see attached Documentation		



1.5

#### Section 1 - Management Responsibility & Quality Planning

All surface finishing related and referenced specifications shall be up to date and available. For example: SAE, AIAG, ASTM, General Motors, Ford, FCA, Toyota, Volvo Truck.

A document control system is pertinent for the handling and internal distribution of received customer specifications and to keep up to date with national or global standards related to surface finishing processes. To ensure all customer requirements are understood and satisfied, the organization shall have all related surface finishing and customer referenced standards and specifications available for use and a process to ensure that they are current. • The organization shall have a process to ensure the timely review, distribution, and implementation of all customer and industry engineering standards and specifications and changes based on customer-required schedule. This process shall be executed as soon as possible and shall not exceed two weeks.

• The organization shall document this process of review and implementation, and it shall address how customer and industry documents are obtained, how they are maintained within the organization, how the current status is established, and how the relevant information is cascaded to the shop floor within the two-week period.

• The organization shall identify who is responsible for performing these tasks.

Guidance	Objective Evidence	Conforming Nonconforming NA
Does the organization have all related surface finishing and customer referenced standards and specifications available for use?	Yes, see specification library on internal network	Conforming
How are standards and specifications obtained?	IHS account / customer portals or through customer	Conforming
Describe the system and timing used to maintain the standards and specifications to ensure that they are up to date.	Procedure # PR-200 or automatic subscription on IHS account	Conforming
Define that process used to review and communicate within the two-week period updated standards and specifications throughou the organization. Include the names and job functions of the responsible personnel.	See procedure # PR-200 & PR-301 section 2.5 / VP of sales and quality manager	Conforming

Comments:

1.6

#### Section 1 - Management Responsibility & Quality Planning

#### There shall be documented process instructions.

• The organization shall have written process instructions for all active parts or family of parts, including relevant part specific requirements. Examples of part specific requirements include process line, plating type, load size, rectifier settings, etc.

These process instructions may take the form of work instructions, job card, computer-based recipes, or other similar documents.

	Guidance	Objective Evidence	Conforming Nonconforming NA
Does f param	the organization have written process instructions for all active parts or family of parts and include all relevant operating neters?	Yes, Per Router Requirments and via B5 exit database and PRC4-(002- 007)	Conforming
What (These	form of process specification is used? e may be in the form of work instructions, job card, computer-based recipes, or other similar documents.)	Router Based Computer input additionally process control sheets.	Conforming
Comm Please	nents: e see attached Documentation		



#### Section 1 - Management Responsibility & Quality Planning

1.7

A valid product capability study shall be performed.

To demonstrate each process is capable of yielding acceptable product, the organization shall perform product capability studies for the initial validation of each process, after relocation of any process equipment, and after a major change of any process or equipment. The organization shall define what constitutes a major change.

• Initial product capability studies shall be conducted for all surface finishing processes per line as defined in scope of work and in accordance with customer requirements. Capability study techniques shall be appropriate for the surface finishing product characteristics, (e.g., surface finishing thickness, corrosion resistance, etc.).

• An action plan shall exist to address the steps to be followed in case capability indices fall outside customer requirements or established ranges.

	Guidance	Objective Evidence	Conforming Nonconforming NA	
Has an	initial product capability study been performed?	Yes, and on new part family's and/or by specification.	Conforming	
Are stu	udies conducted for each surface finishing process for each line in the facility?	Yes, per line. Monthly TT and SS completed for each process.	Conforming	
Has a i change	new study been completed after relocation of any process equipment, major rebuild of any equipment, or any significant e in process chemistry?	No relocation or major rebuild of processing equipement. See procedure # PR-200 section 5 for steps to take - Sales and APQP team designate requirements by customer.	Conforming	
How d	loes the organization define what constitutes a major change?	Procedure # PR-300 Equipment maintenance	Conforming	
Whats	steps are followed when capability indices fall outside specified requirements?	Follow Procedure # PR-301 and see procedure PR-200 if occurance on first time run.	Conforming	
Comm Please	ents: see attached Documentation	·		
	Section 1 - Management Responsibility	& Quality Planning		
1.8	The organization shall collect, analyze, and react to pro	oduct and process data over time.		
• The a • Meth • The o	<ul> <li>The analysis of product characteristics and processes parameters over time can yield vital information for defect prevention efforts.</li> <li>Methods of analysis shall include ongoing trend or historical data analysis of special product and process parameters.</li> <li>The organization shall determine which parameters to include in such analysis.</li> </ul>			
	Guidance	Objective Evidence	Conforming Nonconforming NA	
What	product characteristics and process parameters are used?	Per Job Router requirments and Supplier Requirements Product= Thickness every contaier and salt spray completed monthly. Process= See PRC4-002-007	Conforming	
How is	the ongoing trend or historical data reviewed and analyzed?	Data is Reviewed Daily by Lab Supervisor.	Conforming	
How d	loes the organization use this data to prevent future failures and improve the quality system?	Access database to gather and filter data to be analyzed for efficiency, quality, costs. Data is utilized to drive continuous improvement efforts. By using process parameters we continue to ensure we do not hit out of our control limits.	Conforming	
Comm Please	ents: see attached Documentation	·		



	Section 1 - Management Responsibility & Quality Planning				
1.9	All process control and testing records must be retained for a minimum of one calendar year after the year in which they were created.				
	Guidance	Objective Evidence	Conforming Nonconforming NA		
What	is the process to retain these records?	Procedure # PR-301	Conforming		
What	is the process for retention of customer specific documents with longer retention times?	Procedure # PR-301 and customer specific requirements	Conforming		
Comm Please	ents: see attached Documentation				
	Section 1 - Management Responsibility	& Quality Planning			
1.10	There shall be a process in place to review the monitoring	systems/logs at specified intervals.			
• Man • In th • The	<ul> <li>Management or management designee shall review the monitoring systems/logs at specified intervals.</li> <li>In the case of Hydrogen Embrittlement avoidance and relief, review shall occur prior to parts being released for shipment and shall not exceed 24 hours.</li> <li>The organization shall have reaction plans for nonconformances to process requirements.</li> </ul>				
	Guidance Objective Evidence Objective Evidence Nonconforming NA				
Define	Define the process in place to gather and review this information.				
Identif	Jentify the manager or management designee reviewing the process records from the monitoring systems/logs. Tricia McArthur- Plating Quality Manager James McFeters - Quality Engineer.				
In the	case of Hydrogen Embrittlement baking, is the review taking place within the 24 hour period?	Yes, Daily Morning Tasks	Conforming		
Descri	be reaction plans for nonconformances to the written process requirements.	Notify customer for disposition, QCT3-0015 and PRD3-0001 WI for Bake Ovens.	Conforming		
Comm Please	ents: see attached Documentation				
	Section 1 - Management Responsibility	& Quality Planning			
1.11	Internal assessments shall be completed at a minimum once every 12 months using	the latest revision of the CQI-11 Plating System Assessment.			
	Guidance	Objective Evidence	Conforming Nonconforming NA		
What	is the date of the last AIAG CQI-11 Plating System Assessment?	May 19th 2022	Conforming		
Comm	ents:				



1.12

#### Section 1 - Management Responsibility & Quality Planning

There shall be an internal system in place to authorize reprocessing and it shall be documented.

• The quality management system shall include a documented process for reprocessing that shall include authorization from the quality manager or a designated individual.

• The reprocessing procedure shall describe product characteristics for which reprocessing is allowed as well as those characteristics for which reprocessing is not permissible.

• All reprocessing activity shall require a separate rework specific process control sheet or other identification method, issued by qualified technical personnel denoting the necessary surface finishing modifications.

Records shall clearly indicate when and how any material has been reprocessed.

• The rework of material shall comply with the customer's specifications and/or requirements.

Guidance	Objective Evidence	Conforming Nonconforming NA
Describe the procedure for authorizing reprocessing of nonconforming material.	Yes, QCT4-0025 and PR-205.	Conforming
Does the reprocessing procedure describe product characteristics that allow or not allow reprocessing?	Yes	Conforming
Did the quality manager or manager's designee authorize the rework and determine the reprocessing procedure?	All rework is verified though our MRB review team Pr-205	Conforming
How do you identify that material has been reprocessed?	Yes per Rework Routers per PR-205	Conforming
Do the records clearly indicate when and how any material has been reprocessed including the quality manager's authorization of release?	Yes, Per our MRP System Controls Per PR-205	Conforming
Provide evidence that the rework complies with your customer's specifications and/or requirements.	Yes, Per Elm Plating Certs job router Per PR-205	Conforming
Comments:		



	Section 1 - Management Responsibility & Quality Planning			
1.13	3 The Quality Department shall review, address, and document customer and internal concerns.			
The qu	ality management system shall include a process for documenting, reviewing, and addressing customer concerns and any oth	er concerns internal to the organization.		
	Guidance Conforming Naconforming NA			
Descri	be the procedure for reviewing and addressing external customer and internal concerns.	See procedure # PR-102 / daily & Monthly reporting.	Conforming	
Descri	be the problem solving approach that is used.	8D, 5-Why and customer supplied formats used as listed in procedure # PR-102	Conforming	
Descri	be the communication process used to respond to the originator.	See procedure # PR-102 and communication is done by quality manager	Conforming	
Provid	e a recent example of this procedure in use.	Please see attached 8D along with email chain	Conforming	
Comm	Comments:			



	Section 1 - Management Responsibility & Quality Planning		
1.14	The organization shall have a continual improvement process.		
• The • Iden • The	continual improvement process shall be designed to achieve improvements in quality and productivity. itified actions shall be prioritized and shall include timing (estimated completion dates). organization shall show evidence of program effectiveness.		
	Guidance	Objective Evidence	Conforming Nonconforming NA
Descri	ibe the continual improvement process used to achieve improvements in quality and productivity.	Elm Plating's' KPI's are presented daily to management. Those indicators include internal and external rejects, on time delivery, downtime, productivity. Monthly management reviews of KPIs include the preceding and comparison of actual KPIs achieved to established goals. Daily and monthly meetings are vehicle through which continual improvement opportunities are identified, and subsequently pursued. Presidential focus, Campaigns	Conforming
Provic	e a recent example of how actions are identified, prioritized and completion dates assigned.	During Daily production meetings, completion dates will be assigned based on the needs available to complete.	Conforming
Descri	ibe how the organization measures the effectiveness.	Based on SOP metrics, Verifiying effectivness of actions taken.	Conforming
Comm	nents:		
	Section 1 - Management Responsibility	& Quality Planning	
1.15	There shall be predefined personnel responsible for manage	ement of materials in quarantine area.	
Only t	he quality manager or designee may authorize the disposition of material from quarantine status.		
	Guidance	Objective Evidence	Conforming Nonconforming NA
Define the process for release of material from quarantine. Define the process for release of material from quarantine product review and disposition responsibilities are identified on EPC plating Facility Responsibility Matrix. Quarantined product information is reviewed daily with managers. QCT3-0006		Conforming	
List th	e authorized personnel with job titles.	Tricia McArthur- Quality Manager James McFeters- Quality Engineer	Conforming
Review	w evidence that only these persons are releasing materials from the quarantine area.	Rework Routers are only made by Quality Team.	Conforming
Comm	nents:		

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	Section 1 - Management Responsibility & Quality Planning			
1.16	There shall be documented procedures and/or work instructions for all processes and they shall be available to all of the organization's personnel.			
• Ther • Thes procee	There shall be procedures or work instructions available to personnel covering their responsibilities.     These documents shall include instructions for addressing potential emergencies (such as power failure), equipment start-up, equipment shut-down, product segregation (See 2.3, 2.8), product inspection, and general operating procedures.			
	Guidance Objective Evidence Conforming Nonconforming NA			
Reviev	w the procedure/work instruction for process start-up and shut-down.	Elm Plating Co. utilizes process flowcharts and schematics to identify process flow through the entire plating operation. Control Plans, FMEA's, Work Instructions, Check Sheets and calibration systems are in place and audited to meet requirements of CQI-11 and other specifications that govern the zinc plating process. The procedures include methods for (potential) emergencies (such as power failure), equipment start-up, equipment shut-down, product inspection, and general operating procedures. Procedures and Work Instructions are available on the production floor at point of use.	Conforming	
Reviev	w the procedure/work instruction for process control during operation.	Work Instructions are written for each process and are available at the process. Work Instructions, and/or Procedures encompass the entire process.	Conforming	
What (Such	is the procedure in place to address potential emergencies? as power outage and/or equipment failure).	Yes per MNT3-0014 Lockout/Tagout	Conforming	
Reviev	w the procedures for inspection of the product, in process or after completion.	Yes	Conforming	
Verify	that these procedures/work instructions are accessible to personnel performing the job at all times.	Yes, Electronic instruction available	Conforming	
Comm	nents:	•		



	Section 1 - Management Responsibility & Quality Planning			
1.17	.17 The organization and management shall provide employee training.			
• The • All • Do • Ma	<ul> <li>The organization shall provide employee training for all operations.</li> <li>All employees, including backup and temporary employees, shall be trained.</li> <li>Documented evidence shall be maintained showing the employees trained and the evidence shall include an employee assessment.</li> <li>Management shall define the qualification requirements for each function, and ongoing or follow-up training shall also be addressed.</li> </ul>			
	Guidance	Objective Evidence	Conforming Nonconforming NA	
Revi	ew the process for initial training of all employees, including backup and temporary.	Reviewed training form# HRD4-0003 and training matrix.	Conforming	
Revi	ew the process for ongoing and/or follow-up training.	Reviewed ongoing training documented on form # HRD4-0019 and signed by every employee trained.	Conforming	
Prov	ide a recent copy of the training matrix.	Training matrix reviewed and verified	Conforming	
Prov	de documented evidence that shows how the organization verifies effectiveness of training.	Effectiveness is verified on annual performance reviews	Conforming	
Com	nments:			



	Section 1 - Management Responsibility	& Quality Planning		
1.18	Essential management and supervisory functions shall be performed by qualified personnel at all times and a matrix of these essential responsibilities shall be available for review.			
• The • It sh • This	<ul> <li>The organization shall maintain a responsibility matrix identifying all essential management and supervisory functions and list the qualified personnel who may perform such functions.</li> <li>It shall identify both primary and secondary (backup) personnel for the essential functions (as defined by the organization).</li> <li>This matrix shall be readily available to management at all times.</li> </ul>			
	Guidance	Objective Evidence	Conforming Nonconforming NA	
Revie	w and provide an example of the most recent matrix.	Reviewed responsibilty matrix in BMS manual - page 7	Conforming	
Confirm that the matrix includes both primary and secondary persons.		Conforming		
Descr	ibe how and where this information is made available.	In BMS manual - page 7 and avaiable to all personnel	Conforming	
Comr	Comments:			

	Section 1 - Management Responsibility & Quality Planning				
1.19	There shall be a preventive maintenance program and maintenance data shall be utilized to form a predictive/preventive maintenance program.				
• The • The • Equ • Com • Mai	The organization shall have a documented preventive maintenance program for essential process equipment (as identified by the organization). The program shall be a closed-loop process that tracks maintenance efforts from request to completion to assessment of effectiveness. Equipment operators shall have the opportunity to report problems, and problems shall also be handled in a closed-loop manner. Company data, e.g., downtime, quality rejects, first time-through capability, recurring maintenance work orders, and operator-reported problems, shall be used to improve the preventive maintenance program. Maintenance data shall be collected and analyzed as part of a preventive maintenance program.				
	Guidance Conforming Nonconforming NA				
Show	evidence that a documented preventive maintenance program exists.	Elm Plating's preventive maintenance program requirements are identified in Maintenance Work Instruction MNT3-0012, PM'S for Maintenance. Predictive methods are developed with support from suppliers, equipment OEM's, and the fully staffed Maintenance Department personnel. Any processing equipment downtime is reported for review in daily management meetings.	Conforming		
Descr	ibe the process for reporting problems.	Elm Plating has a formal maintenance work order system supported by work instruction MNT3-0010, Maintenance Work Order Form for scheduled PM. Maintenance work instructions for critical PM activities are used to ensure PM thoroughness and accuracy.	Conforming		
Provid	le a recent example showing that the person reporting the problem received feedback after the problem was resolved.	Maintenance work orders may be requested via the Maintenance Work Order Request, MNT3-0010. Work Order Requests are closed loop, tracked via this log.	Conforming		
Give a	recent example of how the program was used to prevent/predict potential equipment failure.	Maintenance requests are reported in daily management meetings, and during scheduled Management Reviews. During these meeting if it is found to be an ongoing failure mode an adjustment will be made on the current PM.	Conforming		
How i	s the data being generated reviewed with management to improve the quality system?	Data is review during our Daily Operations meetings.	Conforming		
Comn	iomments:				



	Section 1 - Management Responsibility & Quality Planning			
1.20	The organization shall develop a critical spare part list and the parts must be available to minimize production disruptions.			
• Spa	Spare part suppliers, minimum quantity and lead times shall be documented.			
	Guidance     Conforming       Nonconforming     NA			
Prov	de the critical spare parts list.	MNT4-0009 Critical Equipment list	Conforming	
Does	the critical spare parts list include inventory, lead time and suppliers?	Yes	Conforming	
Desc	Describe how and when the organization updates the list. Maintenance manager updated weekly from usage and orders - verified monthly for accuracy		Conforming	
Wha	criteria is used to determine whether critical spare parts are kept at the facility or sourced off site.	All spare parts that have a long lead time	Conforming	
Desc	ibe the process used to maintain minimum quantities.	Monthly inventory / verification of on hand quantitiy	Conforming	
Com	omments:			

	Section 2 - Floor and Material Handling Responsibility			
2.1	The organization shall ensure that customer data entered into the receiving system matches the customer's shipping documents.			
It is cr • The • Doc • Som • The	It is critical that all customer requirements and lot identification be correctly transferred to internal documents. • The facility shall ensure that the data entered in the receiving system match the information on the customer's shipping documents. • Documented processes and evidence of compliance shall exist, e.g., shop travelers, work orders, etc. • Sometimes the material received does not precisely correspond to customer shipping documents. The facility shall have a detailed procedure in place to resolve receiving discrepancies. • The requirements stated above apply to captive, in-house, commercial and all involved departments.			
	Guidance Objective Evidence Conforming NA			
Descr	ibe the receiving process including listing the documentation used.	Receiving inspection matches customer paperwork to orders to generate routers for production. Receiving inspection signs off on router to start the process once the customer paperwork is verified. Procedures are in place to record & reply back to customers for Shipping / Receiving discrepancies such as weight, damaged parts, damaged containers, incorrect paperwork, mixed parts, etc SHP3-0001 staging and receiving	Conforming	
Descr	ibe the process to identify the plating requirements.	Plating Requirements are based on customer Part number in out MRP system.	Conforming	
Descr	ibe the reaction process when material received does not correspond to the customer's documents.	Notify Customer Place in MRB Hold Area for their disposition.	Conforming	
Comn	omments:			



	Section 2 - Floor and Material Handling Responsibility			
2.2	Is product clearly identified and stored throughout the surface finishing process and is lot traceability and integrity maintained?			
Procect • As re • Out-; • The c	<ul> <li><sup>2</sup>rocedures are required for part and container identification to avoid incorrect processing or mixing of lots.</li> <li>As received, in-process, and finished product or material shall be properly segregated, identified, and stored in a dedicated and clearly defined area.</li> <li>Out-going lot(s) shall be traceable to the incoming lot(s).</li> <li>The discipline of precisely identifying lots and linking all pertinent information to them enhances the ability to do root cause analysis and continual improvement.</li> </ul>			
	Guidance	Objective Evidence	Conforming Nonconforming NA	
Descri	be the method that ensures the parts and lot numbers are correctly identified and maintained throughout the process.	Each customer's tub of parts contains a router with a sleeve that includes customer travelers for product identification through out the plating process. The router identifies all customer supplied information, customer, part number, part description, order and tub quantity, container serial number, lot number, etc. It also shows all of the processes that will be done to this part. The Final Inspectors are required to verify that the correct parts are in the tub by matching the picture on the router to the part.	Conforming	
Verify clearly	that received, in-process, and finished product or material is properly segregated, identified, and stored in a dedicated and defined area.	Raw and Finished goods are staged in clearly identified staging areas.	Conforming	
Comm	ents:			
	Section 2 - Floor and Material Handling	Responsibility		
2.3	Procedures shall be adequate to prevent movement of nonconforming p	product into and out of the production system.		
The co • Proc • Proc • Nonc	The control of suspect or nonconforming product is necessary to prevent inadvertent shipment or contamination of other lots. • Procedures shall be adequate to prevent movement of nonconforming product into the production system. • Procedures shall exist addressing authorized personnel, appropriate disposition, product identification and tracking of material flow in and out of hold area. • Nonconforming hold area shall be clearly designated to ensure segregation of such material.			
	Guidance	Objective Evidence	Conforming Nonconforming NA	
Where	is the nonconforming holding area, and how is it identified?	MRB Hold area is located across from our continual bake oven away from all other product.	Conforming	
Descri	Quarantined per work instruction and identified with RRF. Describe the procedure to prevent the unauthorized movement of nonconforming products. error proof system is in place that if the QI has not tracked out shipping will be unable to complete a shipper		Conforming	
Provid	e evidence that material movement in and out of this area is documented.	Yes per our Isolation log. Procedures and work instruction exist for rejected material and proper handling (QCT3-0002 & QCT3-0005)	Conforming	
Comm	omments:			



	Section 2 - Floor and Material Handling	Responsibility	
2.4	For bulk processing there shall be a procedure to identify trap points throughout the entire process to reduce risk of unfinished, improperly coated and mixed parts.		
• The o • Moni • Trap	organization shall have documented procedures to identify and monitor all trap points for each process/equipment. itoring of potential trap points shall occur at minimum every part changeover. points may include: Plating barrels, part containers, loading and unloading equipment, spin dryers, transfer belts.		
	Guidance	Objective Evidence	Conforming Nonconforming NA
Descril	be the procedure to identify and monitor all trap points for each process and/or equipment.	Work Instructions have been created and are maintained for inspecting trap point areas (QCT3-0024) and a log (QCT4-0012) to document occurrences. All trap points must be inspected before any parts can be loaded into a container. Trap Point Audit performed on each processing line weekly by quality inspectors.	Conforming
Provid	e the list of trap points.	See attached	Conforming
Comm	ents:		
	Section 2 - Floor and Material Handling	Responsibility	
25	The handling, storage and packaging shall be adequate to ensure product ou	ality is maintained throughout the entire process	
<ul> <li>Hand</li> <li>Part</li> <li>All part</li> </ul>	lling, storage, and packaging shall be adequate to ensure product quality. cleanliness shall be maintained throughout the process. arts shall be stored in a controlled environment.		
	Guidance	Objective Evidence	Conforming Nonconforming NA
Which	process steps have dedicated in-process containers?	Per Router Requirements	Conforming
How a	re containers maintained to preserve part cleanliness?	Work Instruction detail how the operator is to clean and inspect containers.PRD4-0004 Container Cleanliness tag	Conforming
Descril	Describe how the containers are inspected to ensure they are free of foreign material. Describe how the containers are inspected to ensure they are free of foreign material. Container Cleanliness tag		Conforming
What i (Mater	s used for liner material of customer containers before packing finished goods for shipment? ials like newspapers, used cardboard and bags should be avoided).	See job router for customer specific req. Plastic liners used unless specified.	Conforming
Provid (Storag	e a list of dedicated storage areas that avoid exposure to contamination and corrosion. ge outdoors, near media blasting and corrosive processes such as acid tanks should be avoided).	Marked staging areas.	Conforming
Comm	ents:		

	Section 2 - Floor and Material Handling Responsibility			
2.6	Each process step shall be documented and traceable.			
How d	loes the operator verify that all process steps have been completed in specified order and in within specified time limits?			
	Guidance	Objective Evidence	Conforming Nonconforming NA	
Do yo	a have a document (shop travelers, job sheet, etc.) that specifies all the processes for each part number/part family?	Yes, Elm Job Routers	Conforming	
Define	the procedure that ensures that all processes have been completed in the specified order.	error proof bar code tracking for each step.	Conforming	
Descri	be how time sensitive processes are completed in the specified time limits (e.g., hydrogen embrittlement baking).	Barcode tracking with monitoring.	Conforming	
Provid	e documentation that this process has been followed.	See attached	Conforming	
Comm	ients:			
	Section 2 - Floor and Material Handling	Responsibility		
2.7	Part loading shall be specified, documented	d and controlled.		
• Load • Exan	Loading parameters shall be specified, documented and controlled.     Examples include: parts per rack, part position and orientation, weight per barrel or masking.			
	Guidance	Objective Evidence	Conforming Nonconforming NA	
Describe how the loading parameters are communicated to the operator. Per job router requirments		Per job router requirments	Conforming	
Identi	fy how the loading weight or rack quantity is recorded for each load or rack.	Per Exit Data and 3pc check sheets	Conforming	
Comm	ients:			
	Section 2 - Floor and Material Handling	Responsibility		
2.8	There shall be a procedure for material handling, containment action and product seg	regation in the event of an unplanned process interruption.		
Unplai • Wor • Spec currer • Evid	Unplanned downtime greatly increases the risk of improper processing.  Work instructions specifically addressing potential types of unplanned process interruptions shall be accessible to operators.  Specific instructions shall address containment/reaction plans for each step of the process. Where processes are time critical, immediate actions are required. Examples include process steps exposing parts to: acidic solutions, current, bake or curing processes.  Evidence shall exist showing disposition and traceability of affected product.			
	Guidance	Objective Evidence	Conforming Nonconforming NA	
What	procedure is used to address each step of the process?	Control Plans and Job routers.	Conforming	
Provid	e all work instructions that address unplanned process interruptions.	Control Plans and Specified work instructions Example ZB33-0008	Conforming	
How is	s the affected product traced, dispositioned and documented?	Per PR-205	Conforming	
Comm	omments:			

# 

	Section 2 - Floor and Material Handling Responsibility		
2.9	Plant cleanliness, environment, and working conditions shall be conducive to ensure product quality.		
• Plan • A ho	t cleanliness, housekeeping, environmental, and working conditions shall be adequate to preserve product quality. Susekeeping policy shall be clearly defined and executed.		
	Guidance	Objective Evidence	Conforming Nonconforming NA
Provid	de a copy of the housekeeping procedure.	MNT4-0012 Cleanliness policy	Conforming
Provid	de a copy of the procedure used to handle dropped or spilled parts.	PR-205	Conforming
Describe what is done with loose parts found on the floor of the plant. Scrapped per PR-205		Conforming	
Define inade	Define the process used to review the facility for conditions that are detrimental to quality processing such as chemical spills and inadequate ventilation.		Conforming
Comn	nents:		
	Section 2 - Floor and Material Handling	Responsibility	
2.10	Plant lighting shall be adequate in all ins	pection areas.	
Lighti	ng in the part and/or process inspection areas must be adequate for the intended operation.		
	Guidance	Objective Evidence	Conforming Nonconforming NA
How o the in	How do you ensure the lighting in the part and/or process inspection areas, including loading and unloading areas, is adequate for the intended operation?		Conforming
For pa	For part inspection, how do you arrange the lighting to avoid spot lighting, glare, shadows and distracting reflections?		Conforming
Comn	nents:		



#### Section 4 - Plating System Assessment Job Audit - Finished Product Review Job Identity: **Customer: Shannon** Shop Order Number:870166 Part Number: 29558860 Part Description: Bolt **Material Substrate: Various** Plating Requirements: 120 Hr. WC / 240 Hr. RR / 8µm-16µm Specification Number and Revision: GMW3044 8K240/120N Conforming Question **Identify Relevant Documents & Actual Condition Inspection Element** Nonconforming Number (Provide Data or Values & Embed or Attach Documents) NA Attach evidence that the documentation for the specific part conforms PR-203 - APQP Product Realization. to the requirements including: Process Flow Diagram, FMEA's & Control Plans 4.1 Advanced quality planning process Conforming • FMEA available for each processing line. Process Control Plan 120 Hr. To WC 240 Hr. To RR 8µm-16µm What customer specifications or requirements are used for this part? 4.2 Conforming List the specification(s) and revision(s) Product must be baked within 1 Hr. MRP error proofing inclusive that the order can not be processed until 'Incoming Inspection' is 4.3 Provide evidence of receiving inspection. Conforming completed and entered into the tracking system (The part router must be signed and scanned). Provide the job traveler or attach a copy of this traveler showing: Customer name Lot number 4.4 See attached Conforming Weight/quantity Process instructions Inspection requirements If the lot is divided how is the traceability maintained throughout the 4.5 Lot was not Divided Conforming process? Describe the method used to document each operation as being See Tracking completed and sign off on Job Router. 4.6 completed. Is there a sign-off with time stamp, bar code or scan, etc., Conforming (attached) after each operation? Attach work instructions applicable to this part indicating proper barrel/basket mesh size or perforation (hole size), load size, 4.7 ZB43-0003 Panel Operator Conforming appropriate rack configuration, appropriate part orientation on rack, etc. Identify each process table pertaining to this job audit. Populate the applicable process tables with the actual process results/conditions at 4.8 See process tables Conforming the time this part was processed (Columns H and I in Process Tables A through H). Were appropriate process steps on the job router/traveler signed off? 4.9 Yes Conforming For electronic systems, a screen print is acceptable. Were all inspection steps, as documented in the control plan 4.10 Yes Conforming performed? Were steps/operations performed that were not documented in the 4.11 No Conforming control plan? 4.12 N/A N/A If additional steps were performed, were they authorized?



Question Number	Inspection Element	Identify Relevant Documents & Actual Condition (Provide Data or Values & Embed or Attach Documents)	Conforming Nonconforming NA
4.13	If the order was certified, did the certification accurately reflect the process performed?	Yes	Conforming
4.14	Was the certification signed by an authorized individual?	Yes	Conforming
4.15	Are the parts and containers free of foreign objects or contamination?	Yes	Conforming
4.16	Are packaging requirements identified?	Yes per router requirements	Conforming
4.17	Are parts packaged to prevent mixing or damage to parts (parts packed over height of container)?	Yes	Conforming
4.18	Are storage condition sufficient to maintain part quality. e.g., parts are stored indoors in a clean, dry environment.	Yes	Conforming
4.19	Were the parts properly identified and/or labeled before shipping?	Yes	Conforming
4.20	For the finished part, list each test and inspection requirement per customer specification.	Each part may have one or more requirements determined specification. Parts must meet each requirement. Add additional sections as needed.	by the plating
	Below is an <u>example</u> of how to fill out sections in 4.20.x	Inspection Requirement	Conforming Nonconforming NA
	Test Description:	Corrosion Resistance	
	Test Method:	ASTM B117	
Example	Test frequency or quantity:	daily, 2 parts	Conforming
only	Test Requirement:	240 hrs. no white / 1000 hours no red	
	Result: Attach evidence:	White corrosion at 168 hours, no red LAB Report 12	Nonconforming
	Insert audit data below this line. Add additional sections as need	led.	
	Test Description:	Corrosion Resistance	Conforming
	Test Method:		Conforming
4 20 1	Test frequency or quantity:	Internal Salt Spray Monthly Testing requirement Form QCT4-0019. Monthly surrogate process verification per 120 WC / 240RR.	Conforming
4.20.1	Test Requirement:	Monthly surrogate process verification 120 Hr. To WC 240 Hr. To RR QCT4-0019 Surrogate Testing	Conforming
	Result: Attach evidence:	See attached Surrogate Samples	Conforming
	Test Description:	Plating Thickness Verification and Certification	Conforming
4 20 0	Test Method:	Production and Final Inspection: Eddy current measurement by CMI units.	Conforming
4.20.2	Test frequency or quantity:	3 pieces each barrel at plating line 20 pcs at final inspection	Cornforming
	Test Requirement:	8µm-16µm	Conforming
	Result: Attach evidence:	Visual Shop Certification sent to customer Via ASN	Conforming

### PROCESS TABLE H - Hydrogen Embrittlement Relief Process

All requirements given below are subordinate to applicable customer/OEM specific requirements.

The customer may have additional requirements, e.g., inspection testing, greater frequencies, etc. When performing the job audit, the auditor shall verify plater is conforming to customer requirements.

This table shall be completed separately for each hydrogen embrittlement relief oven.

Definitions:

Time from the end of the plating tank: This is the time at which the parts exit the electrolytic plating step and before entering any rinses, passivates, etc.

Process Line Identification: Oven

Type of Oven: Batch or Continuous- Continuous oven for 4 hour bake requirements, Batch oven for various required times exceeding 4 hours.

	Category/Process Steps	Type of Cor	ntrol	Monitoring Frequency		Observation/ Comments	Job Audit M	Job Audit Measurements	
ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit	
1.0									
H1.1	Process must be in place that limits the acid immersion time in the plating process.	Automatic	Automatic	No more than ten minutes. If more than ten minutes, parts need to be quarantined, and follow customer reaction plan.	9 minutes 40 seconds, verified. during cycle time verification.	Conforming	9 minutes 40 sec	9 min 40 seconds per program controls	
H1.2	All parts for hydrogen embrittlement relief must reach bake temperature within two hours after exiting the electroplating tank. Refer to Pyrometry Section for probe placement.	Automatic/Manual	Automatic	<ol> <li>Time from parts exiting plating tank to exiting plating line.</li> <li>Time required for sufficient amount of parts to be loaded into the de-embrittlement oven. The amount of parts shall represent the maximum load size/rate into the oven.</li> <li>Time to temperature per TUS for a maximum load.</li> <li>The total accumulated time for items 1-3 shall be under 2 hours.</li> </ol>	Verified with thermocouple, thermal profile to show results at various points in ovens and baskets.	Conforming	Under 2hrs	Yes per barcode tracking and exit data.	
H1.3	Oven temperature set point(s) and limits are verified and documented.	Automatic Max SAT difference allowed +/- 5°C (10°F)	Automatic	Start of bake cycle and every batch change.	Part went into Bake at 8:00 am came out of Bake at 1 pm	Conforming	405°F-445°F	425°F	
H1.4	Oven temperature is monitored and recorded.	Automatic	Automatic	A continuous data recorder must be used with a temperature control alarm.	Via Monarch System	Conforming	Digital recorder with temperature control alarms.	Data stored on shared drive as well on the recorder	
H1.5	For hydrogen embrittlement relief ovens, are temperature uniformity surveys performed as defined by Pyrometry Section 3.	Manual	Manual	Uniformity survey must show that ovens were tested with a full production load. The applicator shall demonstrate that the time from plating to baking temperature can be reached within the time limit set by customer requirements.	Uniformity surveys completed annually at max load condition which include total cycle time (ramp-up and ramp down temps).	Conforming	Uniformity survery done annually.	Certification Date : 05/26/2022	



H1.6	For hydrogen embrittlement relief ovens, are thermocouples checked and/or replaced as defined by Pyrometry Sections 3, 3.1 and 3.3.	Manual	Manual	Plater shall have preventive maintenance system that is documented and implemented.	Thermocouples checked or replaced on quarterly schedule.	Conforming	Yes, Per MNT3- 0012	Pms up to date
H1.7	Electronic or mechanical records (not hand-written) must be kept for the following: - Time out of plating line - Time at start of bake cycle - Time at end of bake cycle	Automatic/Manual	Automatic/Manual	For every oven batch the applicator shall record: - Time out of plating line - Time at start of bake cycle - Time at end of bake cycle	Each order is bar scanned in and out of the plating and bake process and a bake log is also maintained for ease of maintaining orders.	Conforming	Yes, Per visual shop tracking system	Yes , per Visual shop tracking system
H1.8	Air filter (if used) change as scheduled.	Manual	Manual	Per oven manufacturer, filter supplier recommendation	No Filter Required	Conforming	Per MNT3-0012	Per MNT3-0012
H1.9	Bake oven logs for each oven batch are reviewed and verified.	Manual	Manual	Before shipment of each batch, an independent inspector (other than operator) shall verify: - Time out of plating line - Time at the start of bake cycle - Time at end of bake cycle Additionally verify the following meet process specifications: - Time to temperature - Length of bake cycle at temperature	Reviewed Daily by Quality Supervisor or Quality Manager.	Conforming	Tracking through Visual Shop	Yes, tracking completed at and verified.
H1.10	Hydrogen embrittlement relief must be performed per customer requirements before rework.		Manual	The rework documents must include: - Time out of plating line - Time at the start of bake cycle - Time at end of bake cycle	Quality Department provides disposition to include bake cycle within 1 hour of plating prior to reprocessing.	Conforming	Yes, All rework is tracked and maintained through Rework routers	Verified By MRB Team.



### PROCESS TABLE A - Zinc & Zinc Alloy Plating

All requirements given below are subordinate to applicable customer/OEM specific requirements.

The customer may have additional requirements, e.g., inspection testing, greater frequencies, etc. When performing the job audit, the auditor shall verify plater is conforming to customer requirements.

\*If minimum requirements are not met, provide supporting records to justify actual conditions. To justify reduced monitoring frequencies, a minimum of 30 consecutive measurements (data points) at stated frequencies must be documented. If any data points at reduced monitoring frequencies are outside of control limits, then revert back to the frequencies stated under the minimum requirements.

For multiple tanks that serve the same purpose copy and paste sections as needed.

Columns H and I are used for the Job Audit (Section 4).

Regularly scheduled measurements (e.g., temperature, concentrations, pH) are to be entered in the appropriate row.

For sections that are not applicable mark NA in the Comments column.

Process Line Identification: Plating lines B3, B4 and B5, Chromate Line 3, Bake Ovens- Barrel Plating B5, Continuous Bake Oven #1, Osolating Basket Chromate line C3, Wax.

Type of Line: Rack or Barrel- Barrel Plating.

	Category/Process Steps	Type of Cor	ntrol	Monitoring Frequency		Observation/ Comments Job Audit M		easurements
ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit
1.0	Alkaline Cleaning							
	Type - Spray - Soak - Electro (anodic or cathodic)	Caustic Base						
	Size, volume:	1,150 Gal						
	Chemical supplier:	Kimya						
A1.1	Temperature (Thermocouple)	Automatic Max SAT difference allowed +/- 5°C (10°F).	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller, verified 11/Day	Conforming	130-200° F	173°
A1.2	Concentration	Manual	Manual	Once per day.	10/Shift	Conforming	3-10%	5.3%
A1.3	Time	Automatic	Automatic	After any program changes.	After any program Changes and 1/Day	Conforming	Set per Program	12 Min 21 Seconds
A1.4	Agitation (if applicable)	Automatic	Automatic	Once every 8 hours.	Per Process Sheet	Conforming	On or Off	On
A1.5	Amperage or Voltage Control (if applicable)	Automatic	Automatic	Once every 8 hours*.	1x per shift	Conforming	N/A	N/A
A1.6	Solution Level - Parts, heaters, and transducers are completely submerged.	Automatic or Manual	Manual	Continuous monitoring by controller. Manually verify daily for automatic controls, every 8 hours for systems without controllers.	4x per shift	Conforming	Yes or No	Yes
A1.7	Impurity Content Check Per chemical supplier recommendation such as: - acid split (oil contamination) - alkalinity ratio	Manual	Manual	Once per week*	N/A	N/A	N/A	N/A
A1.8	Tank and solution maintenance schedule documented and followed.	Manual	Manual	Per preventive maintenance program.	Per PRC-4-2005	Conforming	Per PRC4-2008	Conforming
A1.9	Ultrasonic (if applicable functionality check)	Manual	Manual	Once every 8 hours.	N/A	N/A	N/A	N/A
2.0	Acid Pickling			•				•

	Category/Process Steps	Type of Cor	ntrol	Monitoring Frequency		Observation/ Comments	Job Audit M	easurements
ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit
	Туре:	Hydrochloric Acid						
	Size, volume:	1,110 Gal.						
	Chemical supplier:	Haviland Products						
A2.1	Temperature (Thermocouple) (if applicable)	Automatic Max SAT difference allowed +/- 3°C (5°F).	Automatic	Continuous monitoring by controller. Manually verify daily.	Verified 12x's Per day	Conforming	Automatic	Automatic
A2.2	Concentration	Manual	Manual	Once every 8 hours*	10x's per shift	Conforming	30%-40%	35%
A2.3	Metallic impurity concentration. Obtain metallic impurity limits from chemical supplier with required corrective actions.	Manual	Manual	Once per month.	1x per Month	Conforming	N/A Supplier as requested	N/A
A2.4	Time (Less than 10 Minutes or Customer Specific)	Automatic	Automatic	After any program changes.	After any program changes	Conforming	Per program Controls not to exceed 10 min	9 Min
A2.5	Inhibitor	Manual	Manual	Per Control Plan.	Per Tech Data Sheet	Conforming	Yes Per KI16	Yes
A2.6	Solution Level	Manual	Manual	Once every 8 hours.	4x's per shift	Conforming	Verified every 8 Hrs	Yes
A2.7	Flowing Rinse	Automatic	Automatic	Once every 8 hours.	1x per Shift	Conforming	Verified every 8 Hrs	Yes
A2.8	Tank and solution maintenance schedule documented and followed.	Manual		Per preventive maintenance program.	Per PRC-4-2005	Conforming	Per PRC4-2005	Conforming
3.0	Acid Plating Bath							
	Type:	Chloride Acid Zinc						
	Size, volume:	5,410 Gal (2 Tanks)						
	Chemical supplier:	Dipsol				·		
A3.1	Temperature (Thermocouple)	Automatic Max SAT difference allowed +/- 3°C (5°F).	Automatic	Continuous monitoring by controller. Manually verify daily.	4x per shift	Conforming	85-115°F	101°F
A3.2	Time	Automatic	Automatic	After any program changes.	After any program changes	Conforming	Set per Program	83 Min
A3.3	Solution Level - Parts, heaters, and transducers are completely submerged.	Automatic or Manual	Automatic	Continuous monitoring by controller. Manually verify daily for automatic controls, every 8 hours for systems without controllers.	Continuous Monitoring	Conforming	Verified every 8 Hrs	Confirmed
A3.4	Current/Voltage	Automatic or Manual	Automatic	Once every 8 hours.	Per Job	Conforming	0-1500 AMPS	1213 AMPS
A3.5	Chloride Concentration	Manual	Manual	Once per day.	1x per day	Conforming	17.5-22.5	19.8
A3.6	рН	Manual	Manual	Once every 8 hours.	4x per shift	Conforming	5.4-5.7	5.49
A3.7	Plating Test Cell (Hull Cell)	Manual	Manual	Once per day.	1x Daily	Conforming	Yes or No	Yes
A3.8	Plating Metal Concentration(s)	Manual	Manual	Once per day*.	4x Daily	Conforming	2.5-8 o/g	3.6
A3.9	Alloying Element Concentration (e.g., Ni, Co, Sn; if applicable)	Manual	N/A	Once per day.	N/A	N/A	N/A	N/A
A3.10	Metallic impurity concentration. Obtain metallic impurity limits from chemical supplier with required corrective actions.	Manual	N/A	Once per month.	N/A	N/A	N/A	N/A
A3.11	Buffer (Ammonia / Boric Acid/Acetate per TDS)	Manual	N/A	Once per month.	N/A	N/A	N/A	N/A
A3.12	Filtration Pressure	Continuous	N/A	Once every 8 hours.	N/A	N/A	N/A	N/A

	Category/Process Steps	Type of Co	ntrol	Monitoring Frequency		Observation/ Comments	Observation/ Job Audit M	
ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit
A3.13	Agitation (Rack only - others optional)	Continuous	N/A	Once every 8 hours.	N/A	N/A	N/A	N/A
A3.14	Proprietary chemical additives concentration (e.g., wetter, carrier, brightener)	Manual	N/A	Once per month by Supplier.	N/A	N/A	N/A	N/A
A3.15	Chemical feeders	Automatic	N/A	Once per week.	N/A	N/A	N/A	N/A
A3.16	Fallen part removal	Manual	N/A	As per preventive maintenance schedule.	N/A	N/A	N/A	N/A
A3.17	Tank and solution maintenance schedule documented and followed.	Manual	N/A	Per preventive maintenance program.	N/A	N/A	N/A	N/A
4.0	Alkaline Plating Bath							
	Туре:		N/A		N/A	N/A	N/A	N/A
	Size, volume:		N/A		N/A	N/A	N/A	N/A
	Chemical supplier:		N/A		N/A	N/A	N/A	N/A
A4.1	Temperature (Thermocouple)	Automatic Max SAT difference allowed +/- 3°C (5°F).	N/A	Continuous monitoring by controller. Manually verify daily.	N/A	N/A	N/A	N/A
A4.2	Time	Automatic or Manual	N/A	Automatic - After any program changes. Manual - every load.*	N/A	N/A	N/A	N/A
A4.3	Solution Level - Parts, heaters, and transducers are completely submerged.	Automatic or Manual	N/A	Continuous monitoring by controller. Manually verify daily for automatic controls, every 8 hours for systems without controllers.	N/A	N/A	N/A	N/A
A4.4	Current/Voltage	Automatic or Manual	N/A	Once every 8 hours.	N/A	N/A	N/A	N/A
A4.5	Plating Test Cell (Hull Cell)	Manual	N/A	Once per day.	N/A	N/A	N/A	N/A
A4.6	Zinc Generator Tank (if applicable) -Caustic Concentration -Zinc Concentration	Automatic or Manual	N/A	Once every 8 hours.	N/A	N/A	N/A	N/A
A4.7	Caustic Concentration	Manual	N/A	Once per day.	N/A	N/A	N/A	N/A
A4.8	Zinc Concentration	Manual	N/A	Once per day.	N/A	N/A	N/A	N/A
A4.9	Alloying Element Concentration (e.g., Fe, Ni, Co; if applicable)	Manual	N/A	Once per day.	N/A	N/A	N/A	N/A
A4.10	Complexor Concentration (for alloy baths)	Manual	N/A	Once per month by Supplier.	N/A	N/A	N/A	N/A
A4.11	Metallic impurity concentration. Obtain metallic impurity limits from chemical supplier with required corrective actions.	Manual	N/A	Once per month.	N/A	N/A	N/A	N/A
A4.12	Carbonate (CO <sub>3</sub> ) concentration	Manual	N/A	Once per month (Twice per month for alloy plating).	N/A	N/A	N/A	N/A
A4.13	Proprietary chemical additives concentration (e.g., carrier, brightener)	Manual	N/A	Once per month by Supplier.	N/A	N/A	N/A	N/A
A4.14	Chemical feeders	Automatic	N/A	Once per week.	N/A	N/A	N/A	N/A
A4.15	Agitation (Rack only - others optional)	Continuous	N/A	Once every 8 hours.	N/A	N/A	N/A	N/A
A4.16	Cathode Rod Agitation (if applicable)	Automatic	N/A	Once every 8 hours.	N/A	N/A	N/A	N/A
A4.17	Filtration Pressure	Continuous	N/A	Once every 8 hours.	N/A	N/A	N/A	N/A



HereSubmetherS		Category/Process Steps	Type of Cor	ntrol	Monitoring Frequency		Observation/ Comments	Job Audit M	easurements
MACHSignameIndexMain<	ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit
No.Second second s	A4.18	Fallen part removal	Manual	N/A	Rack: Once every 24 hours. Barrel: Once per week and after any lost load.	N/A	N/A	N/A	N/A
st 	A4.19	Tank and solution maintenance schedule documented and followed.	Manual	N/A	Per preventive maintenance program.	N/A	N/A	N/A	N/A
A1 bisilingisolationisolatio	5.0	Pre-bake acid treatment if baking is required (i.e., nitric, sulfuric, chromate, etc.)							
A2Pice of the probability	A5.1	pH/concentration	Manual	N/A	Once every 8 hours.	4x's per shift	Conforming	0.5-2.2	1.6
AstSequence <th>A5.2</th> <td>Time</td> <td>Automatic</td> <td>Automatic</td> <td>After any program changes.</td> <td>After any Program Changes</td> <td>Conforming</td> <td>Per Part Program</td> <td>16 Seconds</td>	A5.2	Time	Automatic	Automatic	After any program changes.	After any Program Changes	Conforming	Per Part Program	16 Seconds
Index of the stand sector of t	A5.3	Tank and solution maintenance schedule documented and followed.	Manual		Per preventive maintenance program.	Per PRC4-2005	Conforming	Per PRC4-2005	Conforming
Ach 1       Performance	6.0	Hydrogen Embrittlement Relief							
Y0Addition (Marcian Marcian M	A6.1	Refer to PT Embrittlement Bake as required		Per Customer Requirements		Per Customer Requirements	Conforming	Conforming	Conforming
Ar1Meadem ManuMeadem ManuMeadem ManuMeadem ManuMeadem ManuMeadem ManuMeadem ManuMeadem ManuMeadem ManuAr2TodMeadem ManuMeadem ManuMeade	7.0	Acid Activation (i.e., nitric, sulfuric, etc.)							
A7.2Image man (marging)Mana (marging)Marging marging)Marging margingMarging margingMarging margingMarging<	A7.1	pH/concentration	Manual	Manual	Once every 8 hours.	1x every 8 hours	Conforming	1.0-2.0	1.6
A7Jendem <th>A7.2</th> <td>Time</td> <td>Automatic*</td> <td>Automatic</td> <td>After any program changes.</td> <td>After any program Changes</td> <td>Conforming</td> <td>Per Part Program</td> <td>Exit Data results</td>	A7.2	Time	Automatic*	Automatic	After any program changes.	After any program Changes	Conforming	Per Part Program	Exit Data results
Arr       Rinds outling outlin	A7.3	Fallen part removal	Manual	Manual	Once every 24 hours for rack line.	At Tank Cleaning	Conforming	Conforming	At tank Cleaning
a.Bischischischischischischischischischisch	A7.4	Tank and solution maintenance schedule documented and followed.	Manual		Per preventive maintenance program.	Per PRC-4-2005	Conforming	Per PRC4-2008	Conforming
As.Singer Spee - Gendry in comment section c. Singer Spee - Gendry Species Specie	8.0	Rinse (This section is to be repeated as necessary to docu process line. In cases of sequential rinses this section cov	ment all individual rinse step ers the final rinse of the sequ	s in the entire ence)					
AsMar Type-laditify norment section (Newers) and one of the section of	A8.1	Rinse Type - Identify in comment section e.g., Flowing, Counter Flowing, Spray, Stagnant, Drag-in/out, etc.	NA	NA	NA	NA	NA	NA	NA
Ast 9.Ast 9.AstAstAstAstAstAstAstAst 9.AstAstAstAstAstAstAstAstAst 9.AstAstAstAstAstAstAstAstAstAst 9.AstAstAstAstAstAstAstAstAstAst 9.Ast	A8.2	Water Type- Identify in comment section e.g., Municipal, Deionized (DI),Reverse Osmosis (RO), etc.	NA	NA	NA	NA	NA	NA	NA
AsSubic Leel subic subic	A8.3	Agitation type - Identify in comment section (if applicable) e.g., Mechanical (Describe), Air, Ultrasonic, etc.	NA	NA	NA	NA	NA	NA	NA
As.ImportanceImpo	A8.4	Solution Level - Parts, heaters, and transducers are completely submerged.	Automatic or Manual	Manual	Continuous monitoring by controller. Manually verify daily for automatic controls, every 8 hours for systems without controllers.	NA	NA	NA	NA
A8.Resource spectrumAnnualAnnualOne every shoursAnnualAnnualAnnualAnnualA8.For a for	A8.5	Temperature (Thermocouple) (if applicable)	Automatic Max SAT difference allowed +/- 3°C (5°F).		Once every 8 hours.	NA	NA	NA	NA
As.       Isware (applicable)       Manual       Manual       Merce operation       Merce	A8.6	Rinse Quality - Identify in comment section e.g., pH, Impurity Check, Conductivity	Manual		Once every 8 hours.*	NA	NA	NA	NA
A8       Springer Condition (applicable)       Manual	A8.7	Flow rate (if applicable)	Manual		Once every 8 hours.	NA	NA	NA	NA
A8.9       Verify position of incoming water feed is near the bottom (if incoming water feed is near the bottom (i	A8.8	Spray nozzle condition (if applicable)	Manual		Once every 8 hours.	NA	NA	NA	NA
A8.0       Tank and solution maintenance schedule documented and followed.       Manual       Per preventive maintenance program.       NA       NA       NA       NA         9.0       Pasivates	A8.9	Verify position of incoming water feed is near the bottom (if immersion tank).	Manual		Per preventive maintenance program.	NA	NA	NA	NA
9.0 Passivates	A8.10	Tank and solution maintenance schedule documented and followed.	Manual		Per preventive maintenance program.	NA	NA	NA	NA
	9.0	Passivates							

	Category/Process Steps	Type of Co	ntrol	Monitoring Frequency		Observation/ Comments	Job Audit N	leasurements	
ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit	
	Туре:	Chromax ELV							
	Size, volume:	650 Gal							
	Chemical supplier:	MacDermid							
A9.1	Concentration	Automatic or Manual	Automatic	Prior to production start-up. If automatic control, once per day. If manual, once every 8 hours.	3x's per shift	Conforming	8.0-12%	9.20%	
A9.2	Temperature (Thermocouple)	Automatic Max SAT difference allowed +/- 1°C (2°F).	Automatic	Continuous monitoring by controller. Manually verify daily.	4x's per shift	Conforming	Verified via HMI Display	Conforming	
A9.3	Time	Automatic or Manual	Automatic	Automatic - After any program changes. Manual - every load.*	1/cycle Load	Conforming	50-60	55 Seconds	
A9.4	Solution Level - Parts, heaters, and transducers are completely submerged.	Automatic or Manual	Manual	Continuous monitoring by controller. Manually verify daily for automatic controls, every 8 hours for systems without controllers.	Every 2hrs	Conforming	Conforming	Conforming	
A9.5	рН	Automatic*	Automatic	Prior to production start-up. If automatic control, once per day. If manual, once every 8 hours.	12x's per shift	Conforming	1.4-3.0%	2.15%	
A9.6	Agitation	Automatic	Automatic	Once every 8 hours.	1x Per Shift	Conforming	Yes	Yes	
A9.7	Metallic Impurity level(s) (e.g., Fe, Zn)	Manual	Manual	Once per week.	1x Daily	Conforming	0-25000PP	18,860 PP	
A9.8	Filtration if applicable	Automatic		Once every 8 hours.	N/A	N/A	N/A	N/A	
A9.9	Fallen part removal	Manual	Manual	Once every 24 hours for rack line.	At Tank Cleaning	Conforming	At tank PM	Conforming	
A9.10	Tank and solution maintenance schedule documented and followed.	Manual		Per preventive maintenance program.	Per PRC-4-2005	Conforming	Per PRC4-2005	Conforming	
10.0	Supplemental Treatments - Topcoats, Sealants and Frictio	n Modifiers							
	Туре:	Top Coat / Friction Modifiers							
	Size, volume:	400 Gal							
	Chemical supplier:	Mac Dermid/Castrol/Dipsol			_	_		_	
A10.1	Concentration	Manual	Manual	Prior to production start-up. If automatic control, once per day. If manual, once every 8 hours.	4x per shift	N/A	N/A	N/A	
A10.2	Temperature (Thermocouple) (if applicable)	Automatic Max SAT difference allowed +/- 1°C (2°F).	Automatic	Continuous monitoring by controller. Manually verify daily.	Verified Daily	N/A	N/A	N/A	
A10.3	pH (if applicable)	Automatic or Manual	Manual	Prior to production start-up. If automatic control, once per day. If manual, once every 8 hours.	4x per shift	N/A	N/A	N/A	
A10.4	Time	Automatic*	Automatic	After any program changes if automatic.	After any program Changes	N/A	N/A	N/A	
A10.5	Solution Level - Parts, heaters, and transducers are completely submerged.	Automatic or Manual	N/A	Continuous monitoring by controller. Manually verify daily for automatic controls, every 8 hours for systems without controllers.	N/A	N/A	N/A	N/A	
A10.6	Filtration Pressure (if applicable)	Automatic	N/A	Once every 8 hours.	N/A	N/A	N/A	N/A	

	Category/Process Steps	Type of Co	Type of Control Monitoring Frequency Observation/ Comments Job Audit Meas					easurements
ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit
A10.7	Tank and solution maintenance schedule documented and followed.	Manual	N/A	Per preventive maintenance program.	N/A	N/A	N/A	N/A
11.0	Drying							
A11.1	Drying Time	Automatic	Automatic	Per Process Sheet and TDS.	1x Per Month	Conforming	8-9 Min	8 Min 30 Seconds
A11.2	Drying Temperature (Thermocouple)	Automatic Max SAT difference allowed +/- 5°C (10°F).	Automatic	Per Process Sheet and TDS.	5x Daily	Conforming	150°F Min	187°F
A11.3	Verify operation of blowers and/or rotation of dryer.	Manual	Manual	Once per 8 hours.	1x Per Shift	Conforming	Verified every 4 Hrs	Verified Every 5x/Day
A11.4	There is a procedure to ensure dryness of parts.	Manual	Manual	Every container and rack.	Every container and rack. Parts exiting dryer temp checked per ZB43-0016	Conforming	Yes per ZB43-0016	Conforming
12.0	Process Equipment							
Process equipment shall be verified and calibrated per Process Table I. Calibrations shall be certified, posted and up to date. A system shall be used to track calibration dates of equipment. Complete the audit for these identified elements in Process Table I.								
	Guidance			Objective Evidence / Com	ments			Conforming Nonconforming NA
What is identifie	the internal system used for conducting and managing calibrati d in Table I?	on of all relevant equipment	Per EMS PR-113 Mo	nitoring and Measuring Procedure				Conforming
Provide	the document that lists all relevant equipment identified in Proc	ess Table I.	See PT Table I					Conforming
How do	you ensure calibrations are up to date?		Monthly email reminder to verify calibrations, Operators to ensure calibration is valid before using instruments.					Conforming
How do has bee	you ensure new equipment has been added to the calibration li n removed?	st, and inactive equipment	Per EMS PR-113 Monitoring and Measuring Procedure					Conforming
Are cali	bration labels present and up to date for listed equipment?		Yes					Conforming
What is	the reaction plan to any failed verification?		Per EMS PR-113 Mo	nitoring and Measuring Procedure				Conforming
A12.2	Barrels, baskets, and drive mechanism shall be maintained. Verifications shall be performed against a certified standard an	d data recorded.						
	Guidance			Objective Evidence / Com	ments			Conforming Nonconforming NA
How do (i.e., pe Where a	you inspect for the integrity of the barrels, baskets, and drive n forations, trap points, warpage, plugged holes, door gaps, othe are the inspection results documented?	echanism? r damage)	Per PR-300 and ZB5	3-0001 Operator instructions				Conforming
Describ	scribe your preventive maintenance program for barrels, baskets and drive mechanism.		Per PM Maintenance	schedule and procedure MNT3-0012				Conforming
How is e	each barrel and basket uniquely identified for tracking purposes	?	All barrel drives and I	Barrels have their own unique number 1-42 for barrels				Conforming
A12.3	A12.3 Racks and fixtures shall be maintained. Organization shall have preventive maintenance system that is documented and implemented.						_	
	Guidance			Objective Evidence / Com	ments			Conforming Nonconforming NA



	Category/Process Steps	Type of Co	ntrol	trol Monitoring Frequency Observation/ Comments Job Audit Mea				leasurements			
ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit			
How do (i.e., bro Where a	you inspect for the integrity of the racks and fixtures? ken electrical contacts, plating build up, plastisol rack coating a are the inspection results documented?	nd other damage)	N/A					N/A			
Describ	e your preventive maintenance program for racks and fixtures.		N/A	J/A							
How is e	each rack or fixture identified for tracking purposes?		N/A								
A12.4	Rectifiers shall be maintained. The Plater shall have a preventive maintenance system that is	documented and implemented	L								
	Guidance		Objective Evidence / Comments								
Describ (i.e., vol	e the preventive maintenance program for rectifiers used in proc tage, amperage and ripple).	duction and in the laboratory	Per MNT3-0012 and	yearly calibrations				Conforming			
Is the rip	ople reading within the maximum allowable limit recommended t	by the chemical supplier?	Yes					Conforming			
A12.5	All Anodes, Contacts and Bussing shall be maintained. Organization shall have preventive maintenance system that is	documented and implemented	1.								
	Guidance			Objective Evidence / Comments							
Describ bags, ba	e the preventive maintenance program for anodes of all types in askets and auxiliary.	cluding inert, consumable,	Per MNT3-0012					Conforming			
Describ cleanline	e the preventive maintenance program for contacts and electrica ess, high electrical resistance, electrical shorts.	al bussing including	Per MNT3-0012					Conforming			
A12.6	All filters shall be maintained. The organization shall have a preventive maintenance system t	that is documented and implen	nented.								
	Guidance		Objective Evidence / Comments					Conforming Nonconforming NA			
Describ and cart	e the preventive maintenance program for all plating solution filt ridge.	ers to include plate, filter bag	Per PRC3-0045					Conforming			
Describ blowers	e the preventive maintenance program for all air filters used on and fans etc.	ovens, dryers, chillers,	Per MNT3-0012					Conforming			
A12.7	All process and equipment alarms shall be tested on a quarterly The organization shall have a preventive maintenance system t	y basis at a minimum. that is documented and implen	nented.								
	Guidance			Objective Evidence / Com	ments			Conforming Nonconforming NA			
Describe heating,	e the preventive maintenance program where alarms are used for cooling, level control, air circulation and air agitation etc.	or amperage, voltage,	Per Program controls, Exit Data, Audits					Conforming			
Provide	a list of all the alarms that are tested and the test frequency.		Barrel Rotation sensors. Bake oven Temp audit, HMI display audits					Conforming			
A12.8	All process equipment including the tanks have a maintenance	schedule that is documented a	nted and followed.								
	Guidance		Objective Evidence / Comments					Conforming Nonconforming NA			

	Category/Process Steps	Type of Co	ntrol	Monitoring Frequency		Observation/ Comments	Job Audit N	easurements
ITEM #		Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	Conforming Nonconforming NA	Range	Actual Measurements supporting time of Job Audit
The preventive maintenance schedule should include a list of equipment that is in use with the associated process. (i.e., Tanks, liners pumps, plumbing, heaters, ventilation, coalescer, rectifier, heating, cooling, level control, air circulation and air agitation etc.)			Yes per MNT3-0012					Conforming
Describe (i.e., prii	e the method used to develop and document the maintenance s nted, electronic)	chedule.	MNT4-0011 Barrel checksheet MNT4-0025 PM Bake Ovens, MNT4-0023 PM Annual Log					
Provide	an example of a completed sign off record.		Conforming					Conforming
13.0	Test Equipment							
A13.1	Test Equipment shall be verified and calibrated per Process Ta Calibrations shall be certified, posted and up to date. A system shall be used to track calibration dates of equipment. Complete the audit for these identified elements in Process Tat	ble I. ble I.						
	Guidance		Objective Evidence / Comments					
Wet Ana Before u	Wet Analysis: Before use, chemicals must be checked for shelf life and/or expiration date.							Conforming
pH / Co	nductivity Meter		See PT Table I					Conforming
pH / Co	nductivity Probes		See PT Table I					Conforming
Ion Sele	ective probes are optional.		See PT Table I					Conforming
Dedicate	ed probes must be used for chromates / passivates.		See PT Table I					Conforming
Laborate	ory Balance (Weight Scale) (Optional)		See PT Table I					Conforming
Atomic /	Absorption (AA) or Inductively Coupled Plasma (ICP)		See PT Table I					Conforming
X-Ray F	luorescence (XRF) - Optional for Zinc Plating, Required for Zinc	Alloy Plating	See PT Table I					Conforming
Lab Rec	stifier		See PT Table I					Conforming
Hand he	eld thermometer		See PT Table I					Conforming
Pipettes	- Before use, pipettes must be checked for broken tips		See PT Table I					Conforming
Salt Spr	ay Cabinet		See PT Table I					Conforming
Thickne	ss Tester		See PT Table I					Conforming
Lab Ove	ab Oven			See PT Table I				
Torque-	orque-tension/Friction Tester - Required for fastener plating only.			See PT Table I				
Proceed	d to PT - H Embrittlement Bake (if required)							



### PROCESS TABLE I - Process Control and Testing Equipment Verification and Calibration

All requirements given below are subordinate to applicable customer/OEM specific requirements.

The customer may have additional requirements, e.g., inspection testing, greater frequencies, etc. The auditor shall verify plater is conforming to customer requirements.

\*If minimum requirements are not met, provide supporting records to justify actual conditions. To justify reduced monitoring frequencies, a minimum of 30 consecutive measurements (data points) at stated frequencies must be documented. If any data points at reduced monitoring frequencies are outside of control limits, then revert back to the frequencies stated under the minimum requirements.

For multiple tanks that serve the same purpose copy and paste sections as needed.

ITEM #	EQUIPMENT TYPE	Verification Frequency	Conforming Nonconforming NA	Calibration / Certification Frequency	Conforming Nonconforming NA	Observation / Comments
1.0		1	r	r	1	r
11.1	Before use, chemicals must be checked for shelf life and/or expiration date.	Daily	Conforming	NA	Conforming	
l1.2	Temperature Controller	Per Section 3 Pyrometry	Conforming	Annually	Conforming	
11.3	Thermocouple	Per Section 3 Pyrometry	Conforming	Per Section 3 Pyrometry	Conforming	
11.4	pH Meter	Per equipment manufacturer's specifications	Conforming	Annually	Conforming	
l1.5	pH Probe	Once every 4 hours, using a minimum of 2 buffer solutions near the min and max of the chemical control range.	Conforming	NA	Conforming	
I1.6	Conductivity Meter	Per equipment manufacturer's specifications	Conforming	Annually	Conforming	
11.7	Conductivity Probe	Once every 4 hours, using a minimum of 2 reference solutions near the min and max of the chemical control range.	Comforming	NA	Conforming	
l1.8	Ion Selective (ISE ) Probe	Once every 4 hours, using a minimum of 2 reference solutions near the min and max of the chemical control range.	N/A	NA	N/A	
11.9	Laboratory Balance	Monthly using a minimum of 2 reference mass standards.	Conforming	Annually	Conforming	
I1.10	Atomic Absorption (AA)	Before each use.	Conforming	Annually	Conforming	
11.11	Inductively Coupled Plasma (ICP)	Before each use.	N/A	Annually	N/A	
11.12	Ion Chromatography (IC)	Before each use.	N/A	Annually	N/A	
11.13	X-Ray Fluorescence (XRF)	Daily. Thickness and alloy for each combination of plating and substrate.	Conforming	Annually	Conforming	
11.14	Hardness Tester	Daily	Conforming	Annually	Conforming	
I1.15	Profilometer	Daily	N/A	Annually	N/A	
I1.16	Lab Rectifier	NA	Conforming	Annually	Conforming	
11.17	Hand held digital thermometer	NA	N/A	Annually	N/A	
I1.18	Glass thermometer	Visual inspection before each use.	N/A	Annually	N/A	
11.19	Pipettes - Before use, pipettes must be checked for broken tips	Before each use	N/A	NA	N/A	
11.20	Salt Spray Cabinet	Daily	Conforming	Annually	Conforming	
11.21	Thickness Tester	Every 8 hours	Conforming	Annually	Conforming	
11.22	CASS Cabinet	Daily	N/A	Annually	N/A	
11.23	Microscope (Min 100X) with calibrated grid reticle for Pore/Crack Count	Daily	N/A	Annually	N/A	
11.24	Lab Oven	Per Section 3 Pyrometry	N/A	Annually	N/A	
11.25	Torque-tension/Friction Tester	NA	Conforming	Annually	Conforming	
11.26	Refractometer	Monthly	Conforming/ Weekly	NA	N/A	
11.27	Spectrophotometer	Monthly	N/A	Annually	N/A	
11.28	Color Meter	Daily	N/A	Annually	N/A	
11.29	Gloss Meter	Monthly	N/A	Annually	N/A	
11.30	Digital Temperature Recorder (i.e., DataPaq)	NA	Conforming	Annually	Conforming	