

Special Process: Plating System Assessment, 2nd Edition			
Facility Name: Master Finish Company			
Address: 2020 Nelson SE			
Grand Rapids, MI 49510			
Phone Number: (616) 245-1228	Type(s) of Plating Processing at this Facility:		
Fax Number: (616) 245-0039	Process Table A:		
	Zinc		No
Number of Plating Employees at this Facility: 90	Zinc Alloy Plating		No
Process Table B:			
Captive Plater (Y/N): N	Mechanical Plating		No
Commercial Plater (Y/N): Y			
Process Table C:			
Date of Assessment: May 23-June10, 2016	Surface Conditioning of Metals for Decorative Plating or Electropolishing		
		Preplate Vibratory Finishing and Electropolishing	
	Surface Conditioning of Plastics for Decorative Plating		No
Date of Re-assessment (if necessary): N/A	Process Table E:		
	Decorative Plating for Metal and Plastic		Metal Yes / Plastic No
	Process Table F:		
	Electropolishing and/or Chrome Flash on Stainless Steel		Yes
	Process Table G:		
	Hard Chrome Plating		No
	Process Table H:		
	Electroless Nickel		No
	Process Table I:		
	Hydrogen Embrittlement Relief Bake Process		Yes
	Process Table J:		
	Process Control and Testing Equipment		Yes
Current Quality Certification(s): ISO9001:2008			
Personnel Contacted:			
Name:	Title:	Phone:	Email:
John Mulder	COO	616-719-4802	jmulder@masterfinishco.com
Aaron Mulder	VP Engineering	616-245-2618	amulder@masterfinishco.com
Gordan Lozic	Quality Manager	616-719-4806	glozic@masterfinishco.com
Matthew Lomasney	Chemical Engineer	616-245-1229	mlomasney@masterfinishco.com
Steve Phillips	Operations Manager	616-719-4819	sphillips@masterfinishco.com
John Haley	Maintenance Manager	616-719-4816	jhaley@masterfinishco.com
Deborah Koker	QC Lab Tech	616-719-4811	dkoker@masterfinishco.com
Auditors/Assessors:			
Name:	Company:	Phone:	Email:
Rachel Nederhoed	Master Finish Company	616-245-1228	rnederhoed@masterfinish.com
Number of "Not Satisfactory" Findings: None			
Number of "Needs Immediate Action" Findings: None			
Number of "Fail" Findings in the Job Audit(s): None			
Number of Process Table items identified as failed in Comments/Observation column: None			

Special Process: Plating Process Assessment (General Facility Overview)							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
Section 1 - Management Responsibility and Quality Planning							
1.1	Is there a dedicated and qualified plating person on-site?	To ensure readily available expertise, there shall be a dedicated and qualified plating person on the 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 plating knowledge. The qualifications shall include a minimum of 5 years experience in plating and surface finishing or a combination of formal chemistry/chemical engineering education and plating experience totaling a minimum of 5 years.	Organizational Chart, Plating Mgr. Job Description, Plating Process Engineer Job Description, Chemical Engineer Job Description		X		
1.2	Does the plater perform advanced quality planning?	The plater shall incorporate a documented advance quality planning procedure. A feasibility study shall be performed and internally approved for each part. Similar parts can be grouped into part families for this effort as defined by the plater. After the part approval process is approved by the customer, no process changes are allowed unless approved by the customer. The plater shall contact the customer when clarification of process changes is required. This clarification of process changes shall be documented.	APQP Process		X		
1.3	Are plater FMEA's up to date and reflecting current processing?	The plater shall incorporate the use of a documented Failure Mode and Effects Analysis (FMEA) procedure and ensure the FMEAs are updated to reflect current part quality status. The FMEA shall be written for each part or part family or they may be process-specific and written for each process. In any case, they shall address all process steps from part receipt to part shipment and all key plating process parameters as defined by the plater. A cross-functional team shall be used in the development of the FMEA. All characteristics, as defined by the plater and its customers, shall be identified, defined, and addressed in the FMEA.	Part Specific FMEAs		X		
1.4	Are finish process Control Plans up to date and reflecting current processing?	The plater shall incorporate the use of a documented Control Plan procedure 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 and written for each process. In any case, they shall address all process steps from part receipt to part shipment and identify all equipment used and all key plating process parameters as defined by the plater. A cross-functional team, including a production operator, 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 plater and its customers, shall be identified, defined, and addressed in the Control Plans. Sample sizes and Frequencies for evaluation of process and product characteristics shall also be addressed consistent with the minimum requirements listed in the Process Tables.	Part Specific Control Plans		X		

Special Process: Plating Process Assessment (General Facility Overview)							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
1.5	Are all plating related and referenced specifications current and available? For example: SAE, AIAG, ASTM, General Motors, Ford, and Chrysler.	To ensure all customer requirements are both understood and satisfied, the plater shall have all related plating and customer referenced standards and specifications available for use and a method to ensure that they are current. Such standards and specifications include, but are not limited to, those relevant documents published by SAE, AIAG, ASTM, General Motors, Ford, and Chrysler. The plater 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 plater 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 plating organization, how the current status is established, and how the relevant information is cascaded to the shop floor within the two-week period. The plater shall identify who is responsible for performing these tasks.	Current Plating Specification List w/ electronic copies of specifications and industry standards, Annual Book of ASTM Standards***		X		
1.6	Is there a written process specification for all active processes?	The plater shall have written process specifications for all active processes and identify all steps of the process including relevant operating parameters. Examples of operating parameters include process temperatures, cycle times, load rates, rectifier settings, etc. Such parameters shall not only be defined, they shall have operating tolerances as defined by the plater in order to maintain process control. All active processes should have a written process specification. These process specifications may take the form of work instructions, job card, computer-based recipes, or other similar documents.	Computer-based Recipes, Routing Tags, Work Instructions, Analysis Sheets, pH and Temp Sheets		X		
1.7	Has a valid product capability study been performed initially and after process change?	To demonstrate each process is capable of yielding acceptable product the plater shall perform product capability studies for the initial validation of each process, after relocation of any process equipment, and after a major rebuild of any equipment. The plater shall define what constitutes a major rebuild. Initial product capability studies shall be conducted for all plating processes per line as defined in scope of work and in accordance with customer requirements. Capability study techniques shall be appropriate for the plating product characteristics, e.g. plate thickness, corrosion resistance, etc.. Any specific customer requirements shall be met. In the absence of customer requirements, the plater shall establish acceptable ranges for measures of capability. An action plan shall exist to address the steps to be followed in case capability indices fall outside customer requirements or established ranges.	Product Capability Study Records		X		
1.8	Does the plater collect and analyze data over time, and react to this data?	The analysis of products and processes over time can yield vital information for defect prevention efforts. The plater shall have a system to collect, analyze, and react to product or process data over time. Methods of analysis shall include ongoing trend or historical data analysis of special product or process parameters. The plater shall determine which parameters to include in such analysis.	KPI Report TrueChem MasterTracker Records		X		
1.9	Are records retained and available?	All process control and testing records must be retained for a minimum of one calendar year after the year in which they were created.	Process Analysis Records QC Lab Test Records*** Electronic Inspection Records		X		
1.10	Does management review and verify bake oven logs for parts requiring hydrogen embrittlement relief every 24 hours?	Management shall review the oven monitoring systems/logs at intervals not to exceed 24 hours or prior to parts being released for shipment. The plater shall have reaction plans for non-conformances to process requirements. This is to contain, at minimum, requirements for quarantining material and notifying customer.	Hydrogen Embrittlement Log, Oven Chart, MasterTracker Electronic Records		X		

Special Process: Plating Process Assessment (General Facility Overview)							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
1.11	Are internal assessments being completed on an annual basis, at a minimum, incorporating AIAG PSA?	The plater shall conduct internal assessments on an annual basis, at a minimum, using the AIAG PSA. Concerns shall be addressed in a timely manner.	CQI-11 Audit Records		X		
1.12	Is there a system in place to authorize reprocessing and is it documented?	The quality management system shall include a documented process for reprocessing that shall include authorization from 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 new processing control sheet issued by qualified technical personnel denoting the necessary plating modifications. Records shall clearly indicate when and how any material has been reprocessed. The Quality Manager or a designee shall authorize the release of reprocessed product.	Electronic QA Hold / Rework authorization procedure Processing Control Sheet		X		
1.13	Does the Quality Department review, address, and document customer and internal concerns?	The quality management system shall include a process for documenting, reviewing, and addressing customer concerns and any other concerns internal to the organization. A disciplined problem solving approach shall be used.	Customer Complaint Log, Corrective Action Log, ISO Management Reviews		X		
1.14	Is there a continual improvement plan applicable to each process defined in the scope of the assessment?	The plater shall define a process for continual improvement for each plating process identified in the scope of the PSA. The process shall be designed to bring about continual improvement in quality and productivity. Identified actions shall be prioritized and shall include timing (estimated completion dates). The plater shall show evidence of program effectiveness.	Capital/Continuous Improvements Log		X		
1.15	Does the Quality Manager or designee authorize the disposition of material from quarantine status?	The Quality Manager or designee is responsible for authorizing and documenting appropriate personnel to disposition quarantine material.	Hold Area Log		X		
1.16	Are there procedures or work instructions available to plating personnel that define the plating process?	There shall be procedures and work instructions available to plating personnel covering the plating process. These procedures or work instructions shall include methods of addressing potential emergencies (such as power failure), equipment start-up, equipment shut-down, product segregation (See 2.8), product inspection, and general operating procedures. These procedures or work instructions shall be accessible to shop floor personnel.	Work Instructions, Bar Tags, Electronic Plating Recipes, Suspect Load Procedure, Electronic QA Hold Procedure		X		
1.17	Is management providing employee training for plating?	The plater shall provide employee training for all plating operations. All employees, including backup and temporary employees, shall be trained. Documented evidence shall be maintained showing the employees trained and the evidence shall include an assessment of the effectiveness of the training. Management shall define the qualification requirements for each function, and ongoing or follow-up training shall also be addressed.	Job Descriptions, Skill / Training Matrix, Training Records		X		
1.18	Is there a responsibility matrix to ensure that all key management and supervisory functions are performed by qualified personnel?	The plater shall maintain a responsibility matrix identifying all key management and supervisory functions and the qualified personnel who may perform such functions. It shall identify both primary and secondary (backup) personnel for the key functions (as defined by the plater). This matrix shall be readily available to management at all times.	Job Description Skill / Training Matrix		X		

Special Process: Plating Process Assessment (General Facility Overview)							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
1.19	Is there a preventive maintenance program? Is maintenance data being utilized to form a predictive maintenance program?	The plater shall have a documented preventive maintenance program for key process equipment (as identified by the plater). 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 predictive maintenance program.	Preventive Maintenance Schedule (True Chem)		X		
1.20	Has the plater developed a critical spare part list and are the parts available to minimize production disruptions?	The plater shall develop and maintain a critical spare parts list and shall ensure the availability of such parts to minimize production disruptions.	Production Critical List		X		

Special Process: Plating Process Assessment (General Facility Overview)							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
Section 2 - Floor and Material Handling Responsibility							
2.1	Does the facility ensure that the data entered in the receiving system matches the information on the customer's shipping documents?	Documented processes and evidence of compliance shall exist, e.g., shop travelers, work orders, etc. The facility shall have a detailed process in place to resolve receiving discrepancies.	Discrepancy Report, Routing Tags, Incoming Inspection Log		X		
2.2	Is product clearly identified and staged throughout the plating process?	Procedures for part and container identification help to avoid incorrect processing or mixing of lots. Appropriate location and staging within the facility also help to ensure that orders are not shipped until all required operations are performed. Customer product shall be clearly identified and staged throughout the plating process. Non-plated, in-process, and finished product shall be properly segregated and identified. All material shall be staged in a dedicated and clearly defined area.	Routing Tags, Bar Code Tags, MF Labels, Rework Labels, Partial Container Labels, Scrap Tags		X		
2.3	Is lot traceability and integrity maintained throughout all processes?	Out-going lot(s) shall be traceable to the incoming lot(s). The discipline of precisely identifying lots and linking all pertinent information to them enhances the ability to do root cause analysis and continual improvement.	Routing Tags, Incoming Inspection Log, Bar Code Tags, Electronic load tracking records, MF Label		X		
2.4	Are procedures adequate to prevent movement of non-conforming product into the production system?	The control of suspect or non-conforming product is necessary to prevent inadvertent shipment or contamination of other lots. Procedures shall be adequate to prevent movement of non-conforming product into the production system. Procedures shall exist addressing proper disposition, product identification and tracking of material flow in and out of hold area. Non-conforming hold area shall be clearly designated to maintain segregation of such material.	Hold Tags, Rework Tags, Scrap Tags, Hold Area Log		X		
2.5	Is there a system to identify and inspect trap points in the entire plating process to reduce risk of mixed parts (inappropriate, unfinished, or improperly plated parts)?	There shall be a list of trap points and work instructions detailing inspection frequencies.	Process Trap Points Sheet,*** Training Records		X		
2.6	Are containers free of inappropriate material?	Containers handling customer product shall be free of inappropriate material. After emptying and before re-using containers, containers shall be inspected to ensure that all parts and inappropriate material have been removed. The source of inappropriate material shall be identified and addressed. This is to ensure that no nonconforming plating parts or inappropriate material contaminate the finished lot.	Procedure for inspection of containers before use, Training Records		X		
2.7	Is part loading specified, documented and controlled?	Loading parameters shall be specified, documented and controlled. Examples include parts per rack and load size.	Picto-Structions, Part tags, Bar tags, MasterTracker Electronic System		X		
2.8	Are operators trained in material handling, containment action and product segregation in the event of an equipment emergency including power failure?	Unplanned or emergency downtime greatly raises the risk of improper processing. Operators shall be trained in material handling, containment action, and product segregation in the event of an equipment emergency including power failure. Training shall be documented. Work instructions specifically addressing potential types of equipment emergencies and failures shall be accessible to and understood by equipment operators. These instructions shall address containment/reaction plans related to all elements of the process. Evidence shall exist showing disposition and traceability of affected product.	Suspect Load Procedure, Suspect Load Log		X		

Special Process: Plating Process Assessment (General Facility Overview)							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
2.9	Is the handling, storage and packaging adequate to preserve product quality?	The plater's loading/unloading systems, in process handling and shipping process shall be assessed for risk of part damage or other quality concerns.	Work Instructions, Load/unload procedures, Packaging and storage area		X		
2.10	Are plant cleanliness, housekeeping and environmental and working conditions conducive to control and improved quality?	Plant cleanliness, housekeeping, environmental, and working conditions shall be conducive to controlling and improving quality. The plater should evaluate such conditions and their effect on quality. A housekeeping policy shall be clearly defined and executed. The facility shall be reviewed for the following items: loose parts on floor, spillage around tanks, overall plant lighting, fumes etc.	Monthly Safety / Floor Audit Sheets		X		
2.11	Are process control parameters monitored per frequencies specified in Process Tables?	Process control parameters shall be monitored per frequencies specified in Process Tables. Computer monitoring equipment with alarms and alarm logs satisfy the verification requirement. A designated floor person shall verify the process parameters, e.g., by initialing a strip chart or data log.	Analysis Sheets, Temperature & pH Log, FlexTime (automated plating line software) electronic records		X		
2.12	Are out of control/specification parameters reviewed and reacted to?	Are there documented reaction plans to both out of control and out of tolerance process parameters? Is there documented evidence that reaction plans are followed?	TrueChem records, Analysis Sheets, Maintenance Work Orders		X		
2.13	Are In-Process / Final Test Frequencies performed as specified in Process Tables?	In-Process / Final Test Frequencies shall be performed as specified in Process Tables. Refer to Process Tables.	QC Lab Testing Plan, Pre-inspection data, QC Lab Test Records, Electronic Inspection Records		X		

Special Process: Plating Process Assessment (General Facility Overview)							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
2.14	Is product test equipment verified?	Test equipment shall be verified/calibrated per applicable customer specific standard or per an applicable consensus standard, e.g., ASTM, SAE, ISO, NIST, etc. Verification/calibration results shall be internally reviewed, approved and documented. Refer to Process Tables for frequency of checks.	Test Equipment Calibration Log		X		
2.15	Are the water rinses controlled and detailed in the process Control Plan to reflect full process parameters?	Identify operating parameters including: - number of rinse tanks between process stages, - tank type (single rinse, counter flowing, stationary rinse, spray rinse) - flow rate, - water requirements (city or deionized water, reverse osmosis), - filtration (if applicable) - control methods.	Control Plans, TrueChem		X		

Section 3 - Zinc/ Zinc Alloy Plating Equipment							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
3.1	Are process and testing equipment calibrations and/or verification certified, posted, and current?	A system shall be used by the plating facility to track calibration dates of equipment. This system will typically be a computerized tracking system or other notification system. Test equipment shall be verified/calibrated per applicable customer specific standard or consensus standard, e.g., ASTM, SAE, ISO, NIST, etc. Verification/calibration results shall be internally reviewed, approved and documented. Refer to Process Table J, for equipment certification time table.		X			
3.2	Are barrels, racks, and baskets maintained?	Plater shall have preventative maintenance system that is documented and implemented.		X			
3.3	Are rectifiers maintained?	Plater shall have preventative maintenance system that is documented and implemented.		X			
3.4	Are Contacts and Bussing maintained?	Plater shall have preventative maintenance system that is documented and implemented.		X			
3.5	Are filters maintained?	Plater shall have preventative maintenance system that is documented and implemented.		X			
3.6	For hydrogen embrittlement relief ovens, are temperature uniformity surveys performed yearly?	Uniformity survey must show that ovens were tested both empty and with a full load. Parts must come up to temperature within one hour of entering oven and meet temperature tolerance specified by customer.		X			
3.7	For hydrogen embrittlement relief ovens, are thermocouples checked and/or replaced quarterly?	Plater shall have preventative maintenance system that is documented and implemented.		X			
3.8	Is there a drying/curing system in place?	Plater shall have a defined drying process to adequately dry parts. Process to include control and verification of temperature and time.		X			

Section 4 - Decorative (Cu, Ni, Cr) Plating Equipment							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
4.1	Are process and testing equipment calibrations and/or verification certified, posted, and current?	A system shall be used by the plating facility to track calibration dates of equipment. This system will typically be a computerized tracking system or other notification system. Test equipment shall be verified/calibrated per applicable customer specific standard or consensus standard, e.g., ASTM, SAE, ISO, NIST, etc. Verification/calibration results shall be internally reviewed, approved and documented. Refer to Process Table J, for equipment certification time table.	Calibration Log, Calibration Certifications		X		
4.2	Are racks maintained?	Plater shall have preventative maintenance system that is documented and implemented.	MasterTracker Electronic / Barcode Rack Maintenance System		X		
4.3	Are rectifiers maintained?	Plater shall have preventative maintenance system that is documented and implemented.	Preventive Maintenance Schedule		X		
4.4	Are Contacts and Bussing maintained?	Plater shall have preventative maintenance system that is documented and implemented.	Preventive Maintenance Schedule		X		
4.5	Are filters maintained?	Plater shall have preventative maintenance system that is documented and implemented.	Filters Maintenance Schedule		X		
4.6	Is all other applicable equipment maintained?	Plater shall have preventative maintenance system that is documented and implemented.	Preventive Maintenance Schedule		X		
4.7	For all thermocouples/ thermometers are they checked and/or replaced?	Plater shall have preventative maintenance system that is documented, implemented and includes thermocouple and thermometer maintenance.	Daily Thermocouple / Thermometer, Digital temp display, Preventive Maintenance Schedule		X		
4.8	Are the process and equipment alarm checks being tested?	Checks shall be documented. Each alarm shall be reviewed independently for functionality if applicable. Plater shall have a list of alarms relevant to process.	Preventive Maintenance Schedule, Electronic / FlexTime Alarm Log		X		

Section 5 - EN Plating Equipment							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
5.1	Are process and testing equipment calibrations and/or verification certified, posted, and current?	A system shall be used by the plating facility to track calibration dates of equipment. This system will typically be a computerized tracking system or other notification system. Test equipment shall be verified/calibrated per applicable customer specific standard or consensus standard, e.g., ASTM, SAE, ISO, NIST, etc. Verification/calibration results shall be internally reviewed, approved and documented. Refer to Process Table J, for equipment certification time table.		x			
5.2	Are barrels, racks, and baskets maintained?	Plater shall have preventative maintenance system that is documented and implemented.		x			
5.3	Are rectifiers maintained?	Plater shall have preventative maintenance system that is documented and implemented.		x			
5.4	Are Contacts and Bussing maintained?	Plater shall have preventative maintenance system that is documented and implemented.		x			
5.5	Is all other applicable equipment maintained?	Plater shall have preventative maintenance system that is documented and implemented.		x			
5.6	For all thermocouples / thermometers are they checked and/or replaced?	Plater shall have preventative maintenance system that is documented, implemented and includes thermocouple and thermometer maintenance.		x			
5.7	Are filters maintained?	Plater shall have preventative maintenance system that is documented and implemented.		x			
5.8	Are plating tanks designed and equipped per minimum requirements?	Plater shall show evidence that tanks are fabricated from proper material, proper solution movement is ensured with adequate agitation and filtration meets the TDS guidelines. Solution pumps should be capable of turning over the solution minimum 10 times per hour.		x			
5.9	For all ovens, are thermocouples checked and/or replaced quarterly?	Plater shall have preventative maintenance system that is documented and implemented.		x			

Section 6 - Hard Chrome Plating Equipment							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
6.1	Are process and testing equipment calibrations and/or verification certified, posted, and current?	A system shall be used by the plating facility to track calibration dates of equipment. This system will typically be a computerized tracking system or other notification system. Test equipment shall be verified/calibrated per applicable customer specific standard or consensus standard, e.g., ASTM, SAE, ISO, NIST, etc. Verification/calibration results shall be internally reviewed, approved and documented. Refer to Process Table J, for equipment certification time table.		x			
6.2	Are racks maintained?	Plater shall have preventative maintenance system that is documented and implemented.		x			
6.3	Are rectifiers maintained?	Plater shall have preventative maintenance system that is documented and implemented. Including Ripple checks.		x			
6.4	Are Contacts and Bussing maintained?	Plater shall have preventative maintenance system that is documented and implemented.		x			
6.5	For hydrogen embrittlement relief ovens, are temperature uniformity surveys performed yearly?	Uniformity survey must show that ovens were tested both empty and with a dense load. Parts must come up to temperature within one hour of entering oven and meet temperature tolerance specified by customer.		x			
6.6	For hydrogen embrittlement relief ovens, are thermocouples checked and/or replaced quarterly?	Plater shall have preventative maintenance system that is documented and implemented.		x			

Section 6 - Hard Chrome Plating Equipment							
Question Number	Question	Requirements and Guidance	Objective Evidence	Assessment			
				N/A	Satisfactory	Not Satisfactory	Needs Immediate Action
6.7	Are filters maintained if used?	Plater shall have preventative maintenance system that is documented and implemented.		x			
6.8	Is all other applicable equipment maintained?	Plater shall have preventative maintenance system that is documented and implemented.		x			
6.9	For all thermocouples/ thermometers are they checked and/or replaced?	Plater shall have preventative maintenance system that is documented and implemented.		x			
6.10	Are the process and equipment alarm checks being tested?	Checks shall be documented. Each alarm shall be reviewed independently for functionality if applicable. Plater shall have a list of alarms relevant to process.		x			
6.11	Are anodes replaced when necessary?	Anode cleaning, replacement, or maintenance to be documented in PM system.		x			
6.12	Is all electrical bussing being maintained?	Maintenance of bussing due to chemical attack from the chrome solution to be documented in PM system.		x			

PROCESS TABLE A - Zinc & Zinc Alloy Plating

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>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.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>							
Process Line Identification:							
Type of Line: Rack or Barrel							
ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	(Pass / Fail / N/A)
1.0							
		Metal Cleaning					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
A1.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
A1.2	1.4; 2.11; 2.13	Concentration	Manual		Once per day		N / A
A1.3	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
A1.4		Agitation	Automatic		Per process sheet		N / A
A1.5	1.4; 2.11; 2.13	Amperage or Voltage Control	Automatic		Once every 8 hours*		N / A
A1.6		Solution Level	Manual		Once every 8 hours		N / A
A1.7	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

PROCESS TABLE A - Zinc & Zinc Alloy Plating

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>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.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>							
Process Line Identification:							
Type of Line: Rack or Barrel							
ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
2.0		Acid Pickling					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
A2.1	1.4; 2.11; 2.13	Temperature (if applicable)	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
A2.2	1.4; 2.11; 2.13	Concentration	Manual		Once every 8 hours*		N / A
		Metallic impurity concentration. Obtain metallic impurity limits from chemical supplier with required corrective actions.	Manual		Once per month		N / A
A2.3	1.4; 2.11; 2.13	Time (Less than 10 Minutes or Customer Specific)	Automatic		After any program changes.		N / A
A2.4		Inhibitor	Manual		Per Control Plan		N / A
A2.5		Solution Level	Manual		Once every 8 hours		N / A
A2.6	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
3.0		Acid Plating Bath					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
A3.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
A3.2	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
A3.3	1.4; 2.11; 2.13	Current/Voltage	Automatic or Manual		Once every 8 hours		N / A
A3.4		Chloride Concentration	Manual		Once per day		N / A
A3.5		pH	Manual		Once every 8 hours		N / A
A3.6		Plating Test Cell (Hull)	Manual		Once per day*		N / A
A3.7		Plating Metal Concentration(s)	Manual		Once per day*		N / A
A3.8		Metallic impurity concentration. Obtain metallic impurity limits from chemical supplier with required corrective actions.	Manual		Once per month		N / A
A3.9		Buffer (Ammonia / Boric Acid per TDS)	Manual		Once per week*		N / A
A3.10		Filtration	Continuous		Once every 8 hours		N / A
A3.11		Agitation (Rack only - others optional)	Continuous		Once every 8 hours		N / A
A3.12	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
4.0		Alkaline Plating Bath					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
A4.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
A4.2	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
A4.3	1.4; 2.11; 2.13	Current/Voltage	Automatic or Manual		Once every 8 hours		N / A
A4.4		Caustic Concentration	Manual		Once per day		N / A
A4.5		Plating Test Cell (Hull)	Manual		Once per day		N / A
A4.6		Plating Metal Concentration(s)	Manual		Once per day		N / A
A4.7		Metallic impurity concentration. Obtain metallic impurity limits from chemical supplier with required corrective actions.	Manual		Once per month		N / A
A4.8		Filtration	Continuous		Once every 8 hours		N / A
A4.9	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
5.0		Pre-bake acid treatment if baking is required (i.e., nitric, sulfuric, chromate, etc.)					
A5.1		pH/concentration	Manual		Once every 8 hours		N / A
A5.2	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
6.0		Hydrogen Embrittlement Relief					
A6.1		Refer to PT Embrittlement Bake as required					N / A
7.0		Acid Activation (i.e., nitric, sulfuric, etc.)					
A7.1		pH/concentration	Manual		Once every 8 hours		N / A
A7.2	1.4; 2.11; 2.13	Time	Automatic*		After any program changes.		N / A

PROCESS TABLE A - Zinc & Zinc Alloy Plating

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>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.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>							
Process Line Identification:							
Type of Line: Rack or Barrel							
ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
8.0		Passivates					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
A8.1		Concentration	Automatic or Manual		Prior to production start-up. If automatic control once per day, once every 8 hours if manual.		N / A
A8.2	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
A8.3	1.4; 2.11; 2.13	Time	Automatic or Manual		Automatic -After any program changes. Manual - every load.*		N / A
A8.4		pH	Automatic*		Prior to production start-up. If automatic control once per day, once every 8 hours if manual.		N / A
A8.5		Agitation	Automatic		Once every 8 hours		N / A
A8.6		Metallic Impurity level(s) (e.g. Fe, Zn)	Manual		Once per week		N / A
A8.7	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

PROCESS TABLE A - Zinc & Zinc Alloy Plating

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>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.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>							
Process Line Identification:							
Type of Line: Rack or Barrel							
ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
9.0		Supplemental Treatments - Topcoats, Sealants and Friction Modifiers					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
A9.1		Concentration	Manual			Prior to production start-up. If automatic control once per day, once every 8 hours if manual.	N / A
A9.2	1.4; 2.11; 2.13	Temperature (if applicable)	Automatic			Continuous monitoring by controller. Manually verify daily.	N / A
A9.3		pH (if applicable)	Automatic or Manual			Prior to production start-up. If automatic control once per day, once every 8 hours if manual.	N / A
A9.4	1.4; 2.11; 2.13	Time	Automatic*			After any program changes if automatic.	N / A

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
10.0		Drying					
A10.1	3.7	Drying Time	Automatic or Manual		Per Process Sheet and TDS		N / A
A10.2	3.7	Drying Temperature	Automatic or Manual		Per Process Sheet and TDS		N / A
A10.3		Verify operation of blowers and/or rotation of dryer.	Manual		Once per 8 hours		N / A
A10.4	3.7	There is a procedure to ensure dryness of parts.	Manual		Every container and rack.		N / A

Proceed to PT - Embrittlement Bake (if required)

PROCESS TABLE B - Mechanical 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
1.0		Metal Cleaning (Off Line*)					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
B1.1		Temperature	Automatic		Manually measure once every 8 hours		N / A
B1.2		Concentration	Automatic or Manual		Once every 8 hours		N / A
B1.3		Time	Automatic or Manual		After any program changes if automatic.		N / A
B1.4		Agitation	Automatic		Per process sheet		N / A
B1.5		Solution Level	Automatic or Manual		Once every 8 hours		N / A
B1.6	2.15	Rinse	Automatic or Manual		Once every 8 hours		N / A
		Cleaning in Mechanical Plating Barrel					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
B1.7	1.4; 2.11; 2.13	Time	Manual		Per load		N / A
B1.8		Rotation Speed	Manual		Per load		N / A
B1.9		Solution Level	Manual		Per load		N / A
B1.10	2.15	Rinse	Manual		Per load		N / A

PROCESS TABLE B - Mechanical 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
2.0		Mechanical Plating					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
B2.1		Load Size (e.g. weight, area, volume)	Manual		Per load		N / A
B2.2		Water Volume	Manual		Per load		N / A
B2.3	1.4; 2.11; 2.13	Temperature	Manual		Per load		N / A
B2.4		Media Mix (Ratio) Verification by operator the bead size and mix is correct.	Manual		Per load		N / A
B2.5		Media Mix - Sieve Testing Off-line separation dependent on part size and mix unless separation is achieved on-line.	Manual		Once per month		N / A
B2.6		Media (Load Volume)	Manual		Per load		N / A
B2.7		Media (Cleanliness - To Avoid Contamination)	Manual		Once per week		N / A
B2.8		Surface Conditioner (Volume or weight)	Manual		Per load		N / A
B2.9		Surface Conditioner (Time)	Manual		Per load		N / A
B2.10		Surface preparation (Volume or weight) - Cu Flash	Manual		Per load		N / A
B2.11		Surface preparation (Time)	Manual		Per load		N / A
B2.12		Promoter(s) (Volume)	Manual		Per load		N / A
B2.13		Promoter (Time)	Manual		Per load		N / A
B2.14		Zinc Flash (Weight or volume)	Manual		Per load		N / A
B2.15		Zinc Flash (Time)	Manual		Per load		N / A
B2.16		Metal Addition (Weight or volume)	Manual		Per load		N / A

PROCESS TABLE B - Mechanical 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
B2.17		Metal Addition (Number of Adds)	Manual		Per load		N / A
B2.18	3.2	pH adjustments (Dependent on Adds)	Manual		As needed		N / A
B2.19		Metal (Thickness)	Manual		Per load		N / A
B2.20		Water Polish (time)	Manual		Per load		N / A
B2.21		Part/Media Separation	Manual		Per load		N / A
3.0		Passivates					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
B3.1		Concentration	Automatic or Manual		Prior to production start-up. If automatic control once per day, once every 8 hours if manual.		N / A
B3.2	1.4; 2.11; 2.13	Temperature	Automatic or Manual		Automatic - Continuous monitoring by controller and manually verify daily. Manual - every load.*		N / A
B3.3	1.4; 2.11; 2.13	Time	Automatic or Manual		Automatic -After any program changes. Manual - every load.*		N / A

PROCESS TABLE B - Mechanical 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
B3.4		pH	Automatic or Manual		Prior to production start-up. If automatic control once per day, once every 8 hours if manual.		N / A
B3.5		Agitation	Automatic or Manual		Per load		N / A
B3.6		Metallic Impurity level(s) (e.g. Fe, Zn)	Manual		Once per week		N / A
B3.7	2.15	Rinse	Automatic or Manual		Once every 8 hours		N / A
4.0		Supplemental Treatments - Sealers and Torque Tension Modifiers					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
B4.1	1.4; 2.11; 2.13	Concentration	Automatic or Manual		Prior to production start-up. If automatic control once per day, once every 8 hours if manual.		N / A
B4.2	1.4; 2.11; 2.13	Temperature	Automatic or Manual		Automatic - Continuous monitoring by controller and manually verify daily. Manual - every load.*		N / A
B4.3	1.4; 2.11; 2.13	Time	Automatic or Manual		Automatic -After any program changes. Manual - every load.*		N / A

PROCESS TABLE B - Mechanical 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)	
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition		
B4.4	3.2	pH	Automatic or Manual		Prior to production start-up. If automatic control once per day, once every 8 hours if manual.		N / A	
5.0		Drying						
B5.1	3.7	Drying Time	Automatic/Manual		Per process sheet and TDS		N / A	
B5.2	3.7	Drying Temperature	Automatic/Manual		Per process sheet and TDS		N / A	
B5.3		Verify operation of blowers and/or rotation of dryer.	Manual		Once every 8 hours		N / A	
B5.4	3.7	There is a procedure to ensure dryness of parts.	Manual		Every container and rack.		N / A	

PROCESS TABLE C - Surface Conditioning of Metals for Decorative Plating or Electropolishing

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments	
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	(Pass / Fail / N/A)	
1.0		Polishing and Buffing						
C1.1		Type: (Manual or Automatic)						
C1.2		Check which metals are applicable:						
		Steel:						
		Stainless Steel:						
		Aluminum:						
		Zinc diecast:						
2.0		Metal Cleaning						
		Type:						
		Size, volume:						
		Proprietary name:						
		Chemical supplier:						
C2.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified on each production shift.	Pass	
C2.2	1.4; 2.11; 2.13	Concentration	Manual	Manual	Once per day	Once per day	Pass	
C2.3	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any recipe change	Pass	
C2.4		Agitation	Automatic	Automatic	Per process sheet	Once per shift	Pass	
C2.5	4.4	Amperage or Voltage Control	Automatic	Automatic	Once every 8 hours*	Once per shift	Pass	
C2.6		Solution Level	Manual	Manual	Once every 8 hours	Once per shift	Pass	
C2.7	2.15	Flowing Rinse	Automatic	Automatic	Once every 8 hours	Once per shift	Pass	

PROCESS TABLE C - Surface Conditioning of Metals for Decorative Plating or Electropolishing

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments
3.0		Pretreatment					
C3.1		Strike (if applicable)	N/A		N/A		
C3.2	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.		N/A
C3.3	1.4; 2.11; 2.13	Concentration	Manual	Manual	Once every 8 hours*	Once every 12 hours	Pass
C3.4	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any recipe change	N/A
C3.5		Agitation	Automatic	Automatic	Per process sheet	Per process Sheet	Pass
C3.6	4.4	Amperage or Voltage Control	Automatic	Automatic	Once every 8 hours*	Once per shift	Pass
C3.7		Solution Level	Manual	Manual	Once every 8 hours	Once per shift	Pass
C3.8	2.15	Flowing Rinse	Automatic	Automatic	Once every 8 hours	Once per shift	Pass
C3.9		Zincate (Aluminum Only)				N/A	N/A
C3.10	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.	N/A	N/A
C3.11	1.4; 2.11; 2.13	Concentration	Manual		Once every 8 hours*	N/A	N/A
C3.12	1.4; 2.11; 2.13	Time	Automatic		After any program changes.	N/A	N/A
C3.13		Agitation	Automatic		Per process sheet	N/A	N/A
C3.14		Solution Level	Manual		Once every 8 hours	N/A	N/A

PROCESS TABLE C - Surface Conditioning of Metals for Decorative Plating or Electropolishing

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments
C3.15		Dump Schedule	Manual		Manually measure impurities once every 8 hours*	N/A	N/A
C3.16	2.15	Flowing Rinse	Automatic		Once every 8 hours	N/A	N/A
4.0		Acid					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					
C4.1	1.4; 2.11; 2.13	Temperature (if applicable)	Automatic	Operated at room temperature	Continuous monitoring by controller. Manually verify daily.	Operated at room temperature	Pass
C4.2	1.4; 2.11; 2.13	Concentration	Manual	Manual	Once every 8 hours*	First and Third Shift	Pass
C4.3	1.4; 2.11; 2.13	Time (Per Specification)	Automatic	Automatic	After any program changes.	After any recipe change.	Pass
C4.4		Solution Level	Manual	Manual	Once every 8 hours	Once per shift	Pass
C4.5	2.15	Flowing Rinse	Automatic	Automatic	Once every 8 hours	Once per shift	Pass

Decorative Plating - Proceed to PT - Deco Plating Metal & Plastic
Electropolishing and/or Chrome Flash- Proceed to PT - EPCF

PROCESS TABLE D - Surface Conditioning of Plastics for Decorative 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
1.0		Cleaning and Pre-Etch (If Applicable)					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
D1.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
D1.2	1.4; 2.11; 2.13	Concentration	Manual		Once every 8 hours*		N / A
D1.3	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
D1.4		Agitation	Automatic		Per process sheet		N / A
D1.5		Solution Level	Manual		Once every 8 hours		N / A
D1.6	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A
2.0		Etch					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
D2.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
D2.2	1.4; 2.11; 2.13	Concentration	Manual		Once every 8 hours*		N / A
D2.3	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A

PROCESS TABLE D - Surface Conditioning of Plastics for Decorative Plating

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>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.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>							
Process Line Identification:							
ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
D2.4		Agitation	Automatic		Per process sheet		N / A
D2.5		Solution Level	Manual		Once every 8 hours		N / A
D2.6	2.15	Rinse	Automatic		Once every 8 hours		N / A
3.0		Neutralizer					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
D3.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
D3.2	1.4; 2.11; 2.13	Concentration	Manual		Once every 8 hours*		N / A
D3.3	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
D3.4		Agitation	Automatic		Per process sheet		N / A
D3.5		Solution Level	Manual		Once every 8 hours		N / A
D3.6	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

PROCESS TABLE D - Surface Conditioning of Plastics for Decorative 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
4.0		Activator					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
D4.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
D4.2	1.4; 2.11; 2.13	Concentration	Manual		Once every 8 hours*		N / A
D4.3	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
D4.4		Agitation	Automatic		Per process sheet		N / A
D4.5		Solution Level	Manual		Once every 8 hours		N / A
D4.6	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A
5.0		Accelerator					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
D5.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
D5.2	1.4; 2.11; 2.13	Concentration	Manual		Once every 8 hours*		N / A

PROCESS TABLE D - Surface Conditioning of Plastics for Decorative 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
D5.3	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
D5.4		Agitation	Automatic		Per process sheet		N / A
D5.5		Solution Level	Manual		Once every 8 hours		N / A
D5.6	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A
6.0		Electroless Plating					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
D6.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
D6.2	1.4; 2.11; 2.13	Concentration	Manual		Once every 4 hours		N / A
D6.3	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
D6.4		Agitation	Automatic		Per process sheet		N / A
D6.5		Solution Level	Manual		Once every 8 hours		N / A
D6.6	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

PROCESS TABLE D - Surface Conditioning of Plastics for Decorative 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
7.0		Electrolytic Plating - Strike					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
D7.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
D7.2	1.4; 2.11; 2.13	Concentration	Manual		Once per day		N / A
D7.3	4.1, 4.4	Current/Voltage	Automatic or Manual		Once every 8 hours		N / A
D7.4	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
D7.5		Agitation	Automatic		Per process sheet		N / A
D7.6		Solution Level	Manual		Once every 8 hours		N / A
D7.7	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

Decorative Plating - Proceed to PT - Deco Plating Metal & Plastic

PROCESS TABLE E - Decorative Plating for Metal and Plastic

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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
1.0		Acid Copper (if applicable)					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					
E1.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified on each production shift.	Pass
E1.2	1.4; 2.11; 2.13	Concentration(s)	Manual	Manual	Once per day*	Every 12 hours	Pass
E1.3	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any recipe change	Pass
E1.4		Agitation	Automatic	Automatic	Per process sheet	Once per shift	Pass
E1.5	4.1, 4.4	Current/Voltage	Automatic or Manual	Automatic	Once every 8 hours	Once per shift	Pass
E1.6		Solution Level	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
E1.7	2.15	Flowing Rinse	Automatic	Automatic	Once every 8 hours	Once per shift	Pass
E1.8		Filtration	Continuous	Continuous	Once every 8 hours	Once per shift	Pass
E1.9		Post Clean*	Manual	N/A	Once per day	N/A	N/A
2.0		Semi-Bright Nickel					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					

PROCESS TABLE E - Decorative Plating for Metal and Plastic

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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
E2.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified on each production shift.	Pass
E2.2	1.4; 2.11; 2.13	Concentration(s)	Manual	Manual	Once per day*	Once per day	Pass
E2.3	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any recipe change	Pass
E2.4		Agitation	Automatic	Automatic	Per process sheet	Once per shift	Pass
E2.5	4.1, 4.4	Current/Voltage	Automatic or Manual	Automatic	Once every 8 hours	Once per shift	Pass
E2.6		Solution Level	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
E2.7	4.2	pH	Manual	Manual	Once every 8 hours	Once per shift	Pass
E2.8	4.2	Internal stress test	Manual	Manual	1/Month	irregular	Pass
E2.9	4.2	Ductility test	Manual	Manual	1/Month	Once per 2 months	Pass
E2.10	4.2	Sulfur Concentration (as deposited)	Manual	Manual	1/Month	irregular	Pass
E2.11		Filtration	Continuous	Continuous	Once every 8 hours	Once per shift	Pass
3.0		High Activity Nickel (if applicable)					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					
E3.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified daily.	Pass
E3.2	1.4; 2.11; 2.13	Concentration(s)	Manual	Manual	Once per day*	Once per day	Pass
E3.3	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any recipe change	Pass

PROCESS TABLE E - Decorative Plating for Metal and Plastic

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>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.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>							
<p>Process Line Identification:</p>							
ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	(Pass / Fail / N/A)
E3.4		Agitation	Automatic	Automatic	Per process sheet	Once per shift	Pass

PROCESS TABLE E - Decorative Plating for Metal and Plastic

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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
E3.5	4.1, 4.4	Current/Voltage	Automatic or Manual	Automatic	Once every 8 hours	Once per shift	Pass
E3.6		Solution Level	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
E3.7		pH	Manual	Manual	Once every 8 hours	Once per shift	Pass
E3.8		Filtration	Continuous	Continuous	Once every 8 hours	Once per shift	Pass
4.0		Bright Nickel					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					
E4.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified daily.	Pass
E4.2	1.4; 2.11; 2.13	Concentration(s)	Manual	Manual	Once per day*	Once per day	Pass
E4.3	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any recipe changes	Pass
E4.4		Agitation	Automatic	Automatic	Per process sheet	Once per shift	Pass
E4.5	4.1,4.4	Current/Voltage	Automatic or Manual	Automatic	Once every 8 hours	Once per shift	Pass
E4.6		Solution Level	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
E4.7		pH	Manual	Manual	Once every 8 hours	Once per shift	Pass
E4.8		Internal stress test	Manual	Manual	1/Month	irregular	Pass
E4.9		Ductility test	Manual	Manual	1/Month	Irregular	Pass
E4.10		Filtration	Continuous	Continuous	Once every 8 hours	Once per shift	Pass

PROCESS TABLE E - Decorative Plating for Metal and Plastic

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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
5.0		Microporous Nickel					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					
E5.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified daily.	Pass
E5.2	1.4; 2.11; 2.13	Concentration(s)	Manual	Manual	Once per day*	Once per day	Pass
E5.3	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any recipe change	Pass
E5.4		Agitation	Automatic	Automatic	Per process sheet	Once per shift	Pass
E5.5	4.1,4.4	Current/Voltage	Automatic or Manual	Automatic	Once every 8 hours	Once per shift	Pass
E5.6		Solution Level	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
E5.7	4.2	pH	Manual	Manual	Once every 8 hours	Once per shift	Pass
E5.8	2.15	Flowing Rinse	Automatic	Automatic	Once every 8 hours	Once per shift	Pass
E5.9	4.2	STEP Test (of final product)	Manual	Manual	Once per day*	Once per day	Pass

PROCESS TABLE E - Decorative Plating for Metal and Plastic

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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
6.0		Chromium					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					
E6.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified daily.	Pass
E6.2	1.4; 2.11; 2.13	Concentration(s)	Manual	Manual	Once every 4 hours*	Once per shift	Pass
E6.3	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any recipe change	Pass
E6.4		Agitation (if applicable)	Automatic	Automatic	Once every 8 hours	Once per shift	Pass
E6.5	4.1,4.4	Current/Voltage	Automatic or Manual	Automatic	Once every 8 hours	Once per shift	Pass
E6.6		Solution Level	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
E6.7	2.15	Flowing Rinse	Automatic	Automatic	Once every 8 hours	Once per shift	Pass
E6.8	4.2	Pore Count and Pore Size	Manual	Manual	Once per day*	Once per day	Pass

PROCESS TABLE F - Electropolishing and/or Chrome Flash on Stainless Steel

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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
1.0		Electropolish (If Applicable)					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					
F1.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified on each production shift.	Pass
F1.2	1.4; 2.11; 2.13	Concentration(s)	Manual	Manual	Once per day*	Once per day	Pass
F1.3		Time	Automatic or Manual	Automatic	After any program changes.	After any program changes	Pass
F1.4		Agitation	Automatic	Automatic	Per process sheet	Once per shift	Pass
F1.5	4.1, 4.4	Current/Voltage	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
F1.6	2.15	Solution Level	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
F1.7		Flowing Rinse	Automatic	Automatic	Once every 8 hours	Once per shift	Pass

PROCESS TABLE F - Electropolishing and/or Chrome Flash on Stainless Steel

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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
2.0		Chromium (If Applicable)					
		Type:					
		Size, volume:					
		Proprietary name:					
		Chemical supplier:					
F2.1	1.4; 2.11; 2.13	Temperature	Automatic	Automatic	Continuous monitoring by controller. Manually verify daily.	Continuous monitoring by controller. Manually verified on each production shift.	Pass
F2.2	1.4; 2.11; 2.13	Concentration(s)	Manual	Manual	Once every 8 hours*	Once per day	Pass
F2.3	1.4; 2.11; 2.13	Time	Automatic	Automatic	After any program changes.	After any program changes	Pass
F2.4	4.1,4.4	Current/Voltage	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
F2.5		Solution Level	Automatic or Manual	Manual	Once every 8 hours	Once per shift	Pass
F2.6	2.15	Flowing Rinse	Automatic	Automatic	Once every 8 hours	Once per shift	Pass

PROCESS TABLE G - Hard Chrome 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirements	Actual Condition	
1.0		Metal Cleaning					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
G1.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
G1.2	1.4; 2.11; 2.13	Concentration	Manual		Once per day		N / A
G1.3	1.4; 2.11; 2.13	Time	Automatic		After any program changes.		N / A
G1.4		Agitation	Automatic		Per process sheet		N / A
G1.5		Solution Level	Automatic or Manual		Once every 8 hours		N / A
G1.6	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A
2.0		Mechanical Preparation (if Applicable)					
G2.1		Polishing/Buffering:					N / A
G2.2		Wheel revolutions per minute (rpm)	Automatic or Manual		Per process sheet		N / A
G2.3		Buffing wheel material	Manual		Per process sheet		N / A
G2.4		Buffing wheel compound	Automatic/Manual		Per process sheet		N / A
G2.5		Surface profile is checked after process (if applicable).	Manual		Every load		N / A
G2.6		Abrasive Blast Process:					N / A
G2.7		Media type	Manual		Every part change		N / A

PROCESS TABLE G - Hard Chrome 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirements	Actual Condition	
G2.8		Blasting media size/life: - Media size is being checked on a regular schedule to determine effective cleaning and life of product mix.	Manual		Per preventative maintenance schedule, once per week minimum		N / A
G2.9	1.4; 1.6; 2.11; 2.12	Abrasive media flow or nozzle air pressure: - Blasting force is set and maintained within control limits	Automatic or Manual		Per process sheet		N / A
G2.10	1.4; 1.6; 2.11; 2.12	Dwell time is clearly defined. - If additional blasting is required, management approval is needed.	Automatic or Manual		Per process sheet		N / A
G2.11		Abrasive media level	Manual		Every load		N / A
G2.12	1.4; 2.11	Surface cleanliness is checked after process. Copper Sulfate Test (Hogeboom Test)	Manual		Every load*		N / A
G2.13	1.4; 2.11; 2.13	Surface profile is checked after process (if applicable).	Manual		Every load		N / A
3.0		Acid Activation (If applicable)					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
G3.1			Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
G3.2		Concentration	Automatic or Manual		Once per day		N / A
G3.3		Time	Automatic or Manual		Per process sheet		N / A
G3.4		Agitation or Circulation (if applicable)	Automatic		Per process sheet		N / A
G3.5	6.3 ,6.4	Current/Voltage (if applicable)	Automatic or Manual		Once every 8 hours		N / A

PROCESS TABLE G - Hard Chrome 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.

Process Line Identification:

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirements	Actual Condition	
G3.6		Solution Level	Automatic or Manual		Once every 8 hours		N / A
G3.7	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A
4.0		Chrome Plate					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
G4.1		Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
G4.2		Concentration	Manual		Once per day		N / A
G4.3		Metallic impurity concentrations of Fe, Cr+3, Cu, and Ni.	Manual		Once per week		N / A
G4.4		Time	Manual		After any program changes.		N / A
G4.5		Agitation or Circulation	Automatic		At start of each shift		N / A
G4.6	6.3, 6.4	Current/Voltage	Automatic or Manual		Once every 8 hours		N / A
G4.7		Ramp Schedule (If applicable)	Automatic or Manual		Per process sheet		N / A
G4.8		Solution Level	Automatic or Manual		Once every 8 hours		N / A
G4.9	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

Proceed to PT - Embrittlement Bake (If required)

PROCESS TABLE H- Electroless Nickel

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>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.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>							
Process Line Identification:							
Type of Line: Rack or Barrel							
ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
STEEL							
1.0		Alkaline Soak Cleaner					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
H1.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
H1.2	1.4; 2.11; 2.13	Concentration(s)	Manual		Once per day		N / A
H1.3	1.4; 2.11; 2.13	Time	Automatic or Manual		Per process sheet and after program changes.		N / A
H1.4		Agitation	Automatic		Per process sheet		N / A
H1.5		Solution Level	Automatic or Manual		Once every 8 hours		N / A
H1.6	2.15	Flowing Rinse	Automatic or Manual		Once every 8 hours		N / A
2.0							
Alkaline Electrocleaner							
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H2.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
H2.2	1.4; 2.11; 2.13	Concentration(s)	Manual		Once per day		N / A
H2.3	1.4; 2.11; 2.13	Time	Automatic or Manual		Per process sheet and after program changes.		N / A
H2.4		Agitation	Automatic		Per process sheet		N / A
H2.5	4.1, 4.4	Current/Voltage	Automatic or Manual		Per process sheet and TDS Once every 8 hours*		N / A
H2.6		Solution Level	Automatic or Manual		Once every 8 hours		N / A
H2.7	2.15, 4.2	Flowing Rinse	Automatic		Once every 8 hours		N / A
3.0		Acid Activation					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
H3.1	1.4; 2.11; 2.13	Temperature (if applicable)	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
H3.2	1.4; 2.11; 2.13	Concentration(s)	Manual		Once every 8 hours*		N / A
H3.3		Metallic impurity concentration. Obtain metallic impurity limits from chemical supplier with required corrective actions.	Manual		Once per month		N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H3.4	1.4; 2.11; 2.13	Time	Automatic or Manual		Per process sheet and after program changes.		N / A
H3.5		Agitation	Automatic		Per process sheet		N / A
H3.6		Solution Level	Automatic or Manual		Once every 8 hours		N / A
H3.7	2.15, 4.2	Flowing Rinse	Automatic		Once every 8 hours		N / A
		ALUMINUM					
4.0		Soak Cleaner					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
H4.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
H4.2	1.4; 2.11; 2.13	Concentration(s)	Manual		Once every 8 hours*		N / A
H4.3	1.4; 2.11; 2.13	Time	Automatic or Manual		Per process sheet and after program changes.		N / A
H4.4		Agitation	Automatic		Per process sheet		N / A
H4.5		Solution Level	Automatic or Manual		Once every 8 hours		N / A
H4.6	2.15, 4.2	Flowing Rinse	Automatic		Once every 8 hours		N / A
		5.0					
		Etch					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H5.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify daily.		N / A
H5.2	1.4; 2.11; 2.13	Concentration(s)	Manual		Once every 8 hours*		N / A
H5.3		Metallic impurity concentrations of Al and Cu. Obtain limits from chemical supplier with required corrective actions.	Per process sheet and TDS		Once per month		N / A
H5.4	1.4; 2.11; 2.13	Time	Automatic or Manual		Per process sheet and after program changes.		N / A
H5.5		Agitation	Automatic		Per process sheet		N / A
H5.6		Solution Level	Automatic or Manual		Once every 8 hours		N / A
H5.7	2.15, 4.2	Flowing Rinse	Automatic		Once every 8 hours		N / A
6.0		Deoxidizer/Desmutter					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H6.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify once every 8 hours.		N / A
H6.2	1.4; 2.11; 2.13	Concentration(s)	Manual		Once every 8 hours*		N / A
H6.3	1.4; 2.11; 2.13	Metallic impurity concentrations of Al and Cu. Obtain limits from chemical supplier with required corrective actions.	Per process sheet and TDS		Once per month		N / A
H6.4		Time	Automatic or Manual		Per process sheet and after program changes.		N / A
H6.5		Agitation	Automatic		Per process sheet		N / A
H6.6		Solution Level	Automatic or Manual		Once every 8 hours		N / A
H6.7	2.15, 4.2	Flowing Rinse	Automatic		Once every 8 hours		N / A
7.0		Zincate (and second Zincate)					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H7.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify once every 8 hours.		N / A
H7.2	1.4; 2.11; 2.13	Concentration(s)	Manual		Once every 8 hours		N / A
H7.3	1.4; 2.11; 2.13	Metallic impurity concentrations of Al. Obtain limits from chemical supplier with required corrective actions.*	Per process sheet and TDS		Once per month		N / A
H7.4		Time	Automatic or Manual		Per process sheet and TDS		N / A
H7.5		Agitation	Automatic or Manual		Per process sheet and TDS		N / A
H7.6		Solution Level	Automatic or Manual		Once every 8 hours		N / A
		Dump Schedule	Manual		Manually measure impurities once every 8 hours*		N / A
H7.7	2.15, 4.2	Flowing Rinse	Automatic		Once every 8 hours		N / A
8.0		Zincate Strip (when double Zincate)					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
H8.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify once every 8 hours.		N / A
H8.2	1.4; 2.11; 2.13	Concentration(s)	Manual		Once every 8 hours*		N / A
H8.3	1.4; 2.11; 2.13	Metallic impurity concentrations of Al. Obtain limits from chemical supplier with required corrective actions.	Per process sheet and TDS		Once per month		N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H8.4		Time	Automatic or Manual		Per process sheet and after program changes.		N / A
H8.5		Agitation	Automatic		Per process sheet		N / A
H8.6		Solution Level	Automatic or Manual		Once every 8 hours		N / A
H8.7	2.15, 4.2	Flowing Rinse	Automatic		Once every 8 hours		N / A
9.0		EN Strike (optional process)					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
H9.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify every 30 minutes while running.		N / A
H9.2	1.4; 2.11; 2.13	Nickel Concentration	Automatic or Manual		Prior to production start-up. Automatic: verify daily. Manually: once every 30 minutes while running.		N / A
H9.3		Time	Automatic or Manual		Per process sheet and after program changes.		N / A
H9.4	1.4; 2.11; 2.13	Agitation	Automatic		Per process sheet		N / A
H9.5		Hypophosphite concentration	Manual		Once every 8 hours*		N / A
H9.6		Solution loading (surface area of parts per volume plating solution)	Manual		Per process sheet and TDS		N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H9.7		Solution Level	Automatic or Manual		Once per hour		N / A
H9.8		pH	Automatic or Manual		Once every 30 minutes while running*		N / A
H9.9		Filtration	Continuous per process sheet & TDS		Once every 8 hours		N / A
H9.10		Bath life (metal turnovers) (calculate by specific gravity or orthophosphite or nickel adds made)	Manual		Per process sheet and TDS		N / A
H9.11	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A
10.0		Electroless Nickel					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
H10.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify every 30 minutes while running.		N / A
H10.2	1.4; 2.11; 2.13	Nickel Concentration	Automatic or Manual		Prior to production start-up. Automatic: verify daily. Manually: once every 30 minutes while running.		N / A
H10.3	1.4; 2.11; 2.13	Time	Manual		Per process sheet and after program changes.		N / A
H10.4		Agitation	Automatic		Per process sheet		N / A
H10.5		Hypophosphite concentration	Manual		Once every 8 hours		N / A

PROCESS TABLE H- Electroless Nickel

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>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.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>							
Process Line Identification:							
Type of Line: Rack or Barrel							
ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H10.6		Solution loading (surface area of parts per volume plating solution)	Manual		Per process sheet and TDS		N / A
H10.7		Solution Level	Automatic or Manual		Once per hour		N / A
H10.8		Bath life (metal turnovers) (calculate by specific gravity or orthophosphite or nickel adds made)	Manual		Once per day		N / A
H10.9		pH	Automatic or Manual		Once every 30 minutes while running*		N / A
H10.10		Filtration	Continuous per process sheet & TDS		Once every 8 hours		N / A
H10.11	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A
H10.12		Hardness Test (if applicable)	Manual		Per process sheet and TDS		N / A
H10.13		Phosphorous content (if applicable)	Manual		Per process sheet and TDS		N / A
11.0		Specialty Electroless Nickel Alloys and Composites					
		Type:					N / A
		Size, volume:					N / A
		Proprietary name:					N / A
		Chemical supplier:					N / A
H11.1	1.4; 2.11; 2.13	Temperature	Automatic		Continuous monitoring by controller. Manually verify every 30 minutes while running.		N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
H11.2	1.4; 2.11; 2.13	Nickel Concentration	Automatic or Manual		Prior to production start-up. Automatic: verify daily. Manually: once every 30 minutes while running.		N / A
H11.3	1.4; 2.11; 2.13	Time	Manual		Per process sheet and after program changes.		N / A
H11.4		Agitation	Automatic		Per process sheet		N / A
H11.5		Reducing agent concentration	Manual		Once every 8 hours*		N / A
H11.6		Specialty Electroless Nickel Alloy and Composite concentrations	Manual		Per process sheet and TDS		N / A
H11.7		Solution loading (surface area of parts per volume plating solution)	Manual		Per process sheet and TDS		N / A
H11.8		Solution Level	Automatic or Manual		Once per hour		N / A
H11.9		Bath life (metal turnovers) (calculate by specific gravity or orthophosphite or nickel adds made)	Manual		Once per day		N / A
H11.10		pH	Automatic or Manual		Once every 30 minutes while running*		N / A
H11.11		Filtration	Per process sheet & TDS		Once every 8 hours		N / A
H11.12	2.15	Flowing Rinse	Automatic		Once every 8 hours		N / A

PROCESS TABLE H- Electroless Nickel

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.

Process Line Identification:

Type of Line: Rack or Barrel

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
12.0		Heat Treatment for Hardness (if applicable)					
H12.1		Oven temperature set point(s) and limits are verified and documented.	Manual		Start of bake cycle and every batch change.		N / A
H12.2		Oven temperature is monitored and recorded.	Automatic		A continuous chart recorder must be used with a temperature control alarm.		N / A
H12.3		Temperature uniformity surveys are performed yearly.	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.		N / A
H12.4		Thermocouples are checked and/or replaced quarterly.	Manual		Supplier shall have preventative maintenance system that is documented and implemented.		N / A
H12.5		Inert gas pressure set point(s) and limits are verified and documented.	Manual		Start of bake cycle and every batch change.		N / A
H12.6		Time is electronically recorded or mechanically recorded (not hand-written).for start of bake cycle,and end of bake cycle.	Automatic/Manual		Every baking batch.		N / A

Proceed to PT I - Embrittlement Bake (If required)

PROCESS TABLE I - Hydrogen Embrittlement Relief Bake 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.

*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.

Process Line Identification:

Type of Oven: Batch or Continuous

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
1.0							
I1.1		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.	Follows electronic plating Recipes, Suspect load and containment procedure	Pass
I1.2		All parts for hydrogen embrittlement relief must reach bake temperature at the center of the load within two hours after plating.	Automatic/Manual	Automatic / Manual	If requirement or procedure is not met, parts need to be quarantined, and follow customer reaction plan.	Hydrogen embrittlement log review procedure, light alarm system	Pass
I1.3		Oven temperature set point(s) and limits are verified and documented.	Manual	Automatic / Manual	Start of bake cycle and every batch change.	At the start of each bake cycle / batch change	Pass
I1.4		Oven temperature is monitored and recorded.	Automatic	Automatic	A continuous chart recorder must be used with a temperature control alarm.	A continuous chart recorder - Navigator Software, used in past	Pass
I1.5		For hydrogen embrittlement relief ovens, are temperature uniformity surveys performed yearly?	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.	Temperature uniformity surveys performed yearly	Pass

PROCESS TABLE I - Hydrogen Embrittlement Relief Bake 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.

*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.

Process Line Identification:

Type of Oven: Batch or Continuous

ITEM #	Related PSA Question #	Category/Process Steps	Type of Control		Monitoring Frequency		Observation/Comments (Pass / Fail / N/A)
			Minimum Requirement	Actual Condition	Minimum Requirement	Actual Condition	
I1.6		For hydrogen embrittlement relief ovens, are thermocouples checked and/or replaced quarterly?	Manual	Manual	Plater shall have preventative maintenance system that is documented and implemented.	Preventive maintenance schedule	Pass
I1.7		Time and date out of plating line, start of bake cycle, and end of bake cycle, is electronically or mechanically recorded (not hand-written).	Automatic/Manual	Automatic	Every baking batch.	Every baking batch	Pass
I1.8		Air filter (if used) change is scheduled.	Manual	Manual	Per oven manufacturer, filter supplier recommendation	Changed per filter supplier recommendation	N/A
I1.9		Bake oven logs for each batch are reviewed and verified.	Manual	Manual	Before shipment of each batch an independent inspector (other than operator) shall verify that time and date out of plating line, start of bake cycle, temperature and end of bake cycle meet process specification.	Independent inspector reviews bake data on bake dashboard	Pass
I1.10		Hydrogen embrittlement relief must performed per customer requirements before re-work.			Hydrogen embrittlement relief is a time sensitive process. In the case of re-work, the parts must be baked immediately. This shall be reflected in the re-work process control documents.	Hydrogen embrittlement performed before re-work per control plan, part specific work instructions	Pass

PROCESS TABLE J - Process Control and Testing Equipment

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	Zinc/Zinc Alloy	Decorative Plating	Electroless Nickel	Hard Chrome	Electropolish	Chrome flash	Verification Frequency	Calibration / Certification Frequency	Observation/Comments (Pass / Fail / N/A)
1.0	LABORATORY EQUIPMENT									
J1.1	Wet Analysis: Before use, chemicals must be checked for shelf life and/or expiration date	X	X	X	X	X	X	Daily	N/A	Pass
J1.2	pH / Conductivity Meter	X	X	X		X		Daily	Yearly	Pass
J1.3	pH / Conductivity Probes Solution compatible probes must be used. Dedicated probes must be used for chromates / passivates.	X	X	X		X		Before each use	N/A	Pass
J1.4	Laboratory Balance (Weight Scale) (Optional)	X	X	X	X			Monthly	Yearly	Pass
J1.5	Atomic Absorption (AA)*	X	X	X				Before each use	Yearly	Pass
J1.6	X-Ray Fluorescence (XRF)	Alloy Only						Thickness and alloy verification daily	Yearly	N/A
J1.7	Hardness Tester*		X		X			Daily	Yearly	N/A
J1.8	Profilometer				X			Daily	Yearly	N/A
J1.9	Lab Rectifier	X	X		X			When applicable	Yearly	Pass

PROCESS TABLE J - Process Control and Testing Equipment

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	Zinc/Zinc Alloy	Decorative Plating	Electroless Nickel	Hard Chrome	Electropolish	Chrome flash	Verification Frequency	Calibration / Certification Frequency	Observation/Comments (Pass / Fail / N/A)
TESTING EQUIPMENT										
J2.0	Salt Spray Cabinet	X			X			Daily	Yearly	Pass
J2.2	Thickness Tester	X	X	X	X		X	Daily	Yearly	Pass
J2.3	Coulometric (STEP) Tester		X					Daily	Yearly	Pass
J2.4	CASS Cabinet		X		X		X	Daily	Yearly	Pass
J2.5	Microscope (Min 100X) with calibrated grid reticle for Pore/Crack Count		X		X			N/A	Yearly	Pass
J2.6	Freezer		X					Daily	Yearly	N/A
J2.7	Lab Oven	X	X				X	Daily	Yearly	Pass

PROCESS TABLE J - Process Control and Testing Equipment

<p>All requirements given below are subordinate to applicable customer/OEM specific requirements.</p> <p>The customer may have additional requirements, e.g., inspection testing, greater frequencies, etc. The auditor shall verify plater is conforming to customer requirements.</p> <p>*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.</p> <p>For multiple tanks that serve the same purpose copy and paste sections as needed.</p>										
ITEM #	EQUIPMENT TYPE	Zinc/Zinc Alloy	Decorative Plating	Electroless Nickel	Hard Chrome	Electropolish	Chrome flash	Verification Frequency	Calibration / Certification Frequency	Observation/Comments (Pass / Fail / N/A)
3.0	PROCESSING EQUIPMENT									
J3.1	Rectifier	X	X		X	X	X	Ripple checked every 12 months	N/A	Pass
J3.2	Amp Meter/Volt Meter	X	X		X	X	X	Checked every 12 months	N/A	Pass
J3.3	Plating Solution Filters	X		X				Daily	N/A	N/A
J3.4	Plate filters (bright and semi-bright nickel tanks)		X					Daily	N/A	Pass
J3.5	Oven Temperature recorder							Every 3 months	Yearly	Pass
J3.6	Data/Chart recorder for deembrittlement or EN hardness oven	X	X	X				Yearly	N/A	N/A
J3.7	Thermocouples	X	X	X				Every 3 months		Pass
J3.8	Controllers: (If Used)	X	X	X	X	X	X	Set points and/or feed rates are verified (if applicable)		
J3.9	Automatic feeders							Daily		Pass
J3.10	Timers							Daily		N/A
J3.11	Temperature	X	X	X	X	X	X	Daily	Yearly	Pass
J3.12	Volume							Daily		Pass
J3.13	pH / Conductivity							Daily		Pass

PROCESS TABLE J - Process Control and Testing Equipment

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.

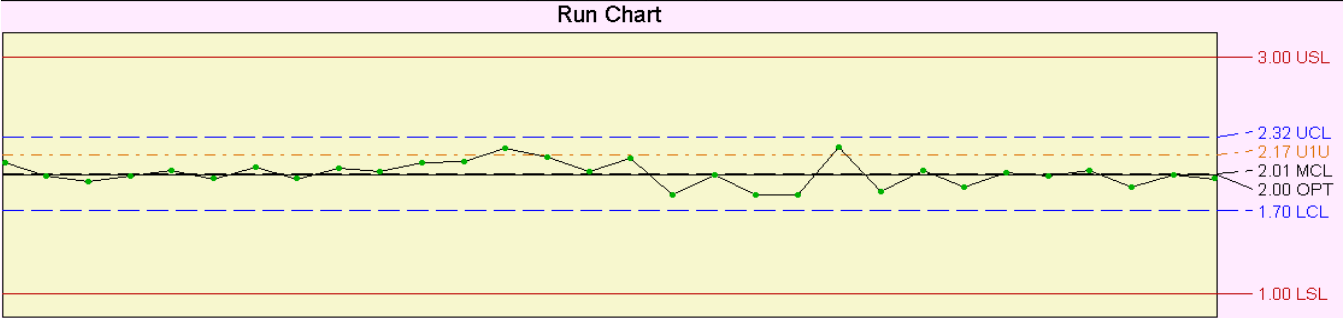
ITEM #	EQUIPMENT TYPE	Zinc/Zinc Alloy	Decorative Plating	Electroless Nickel	Hard Chrome	Electropolish	Chrome flash	Verification Frequency	Calibration / Certification Frequency	Observation/Comments (Pass / Fail / N/A)
J3.14	Agitation type:	X	X	X		X				
J3.15	Air							Daily		Pass
J3.16	Cathode rod							Daily		N/A
J3.17	Eductor							Daily		Pass
J3.18	Water source:	X	X	X	X	X	X			
J3.19	POTW									N/A
J3.20	RO							Daily		Pass
J3.21	Well									N/A
J3.22	Deionized			X				Daily		N/A
J3.23	Drying type:	X	X	X	X	X	X			
J3.24	Spin Dryer							Daily		Pass
J3.25	Forced Air Drying							Daily		Pass
J3.26	Belt Oven							Daily		N/A
J3.27	Box Oven							Daily		N/A

Reduced Monitoring Justification

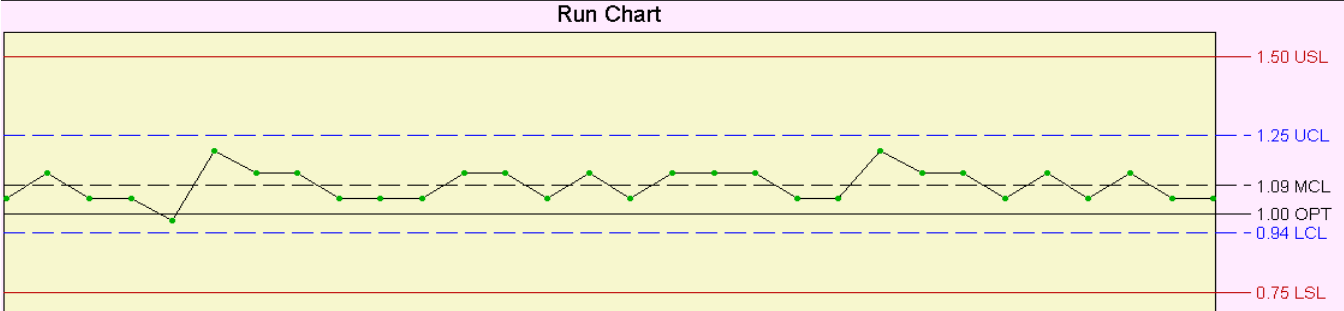
Reduced Monitoring Justification

Surface Prep: Strike Tanks

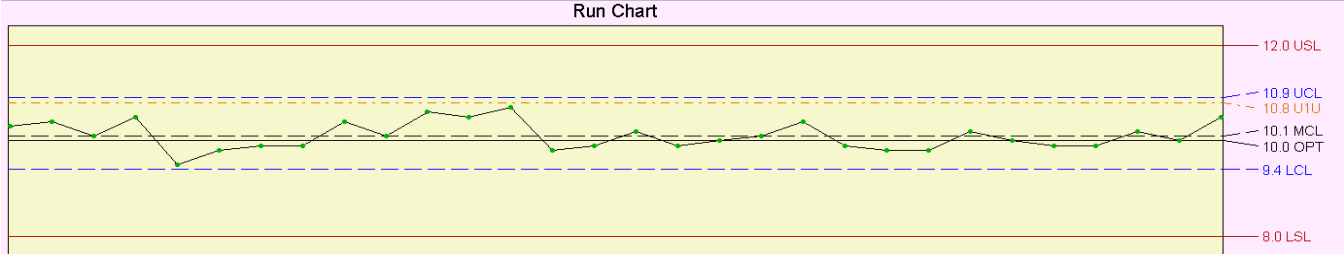
Tank: HT 13 - Cyanide Copper Strike
Component: **oz/gal Free Cyanide**
For Dates: 5/6/2016 12:22 AM - 5/27/2016 7:32 AM
Options | Overview | **Run** | Histogram | Settings



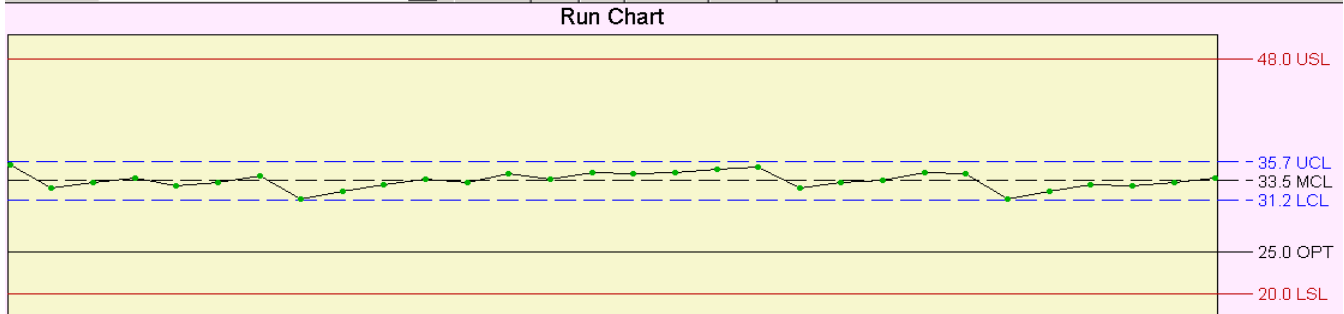
Tank: HT 13 - Cyanide Copper Strike
Component: **oz/gal Potassium Hydroxide**
For Dates: 5/6/2016 12:22 AM - 5/27/2016 7:32 AM
Options | Overview | **Run** | Histogram | Settings



Process: Hoist Line
Tank: HT 33 - Woods Nickel Strike
Component: **oz/gal Hydrochloric Acid**
For Dates: 5/5/2016 12:19 AM - 5/27/2016 11:18 AM
Options | Overview | **Run** | Histogram | Settings



Tank: HT 33 - Woods Nickel Strike
Component: **oz/gal Nickel Chloride**
For Dates: 4/22/2016 12:09 AM - 5/27/2016 11:18 AM
Options | Overview | **Run** | Histogram | Settings

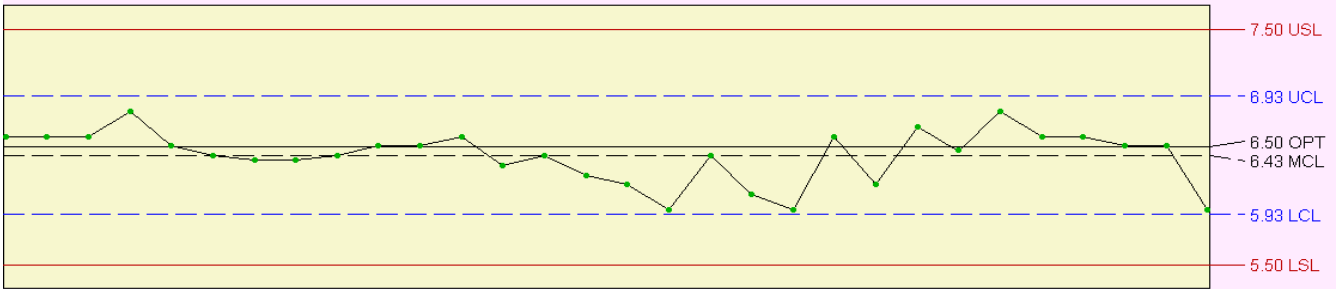


Reduced Monitoring Justification

Strike Tanks (cont.)

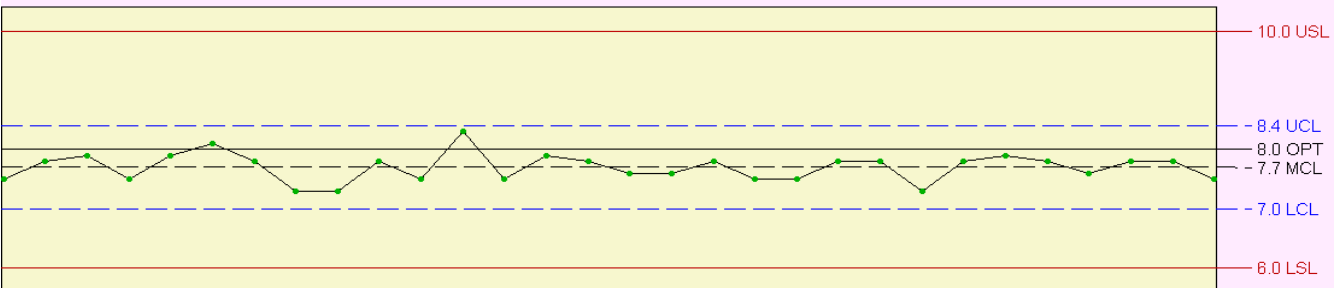
Tank: HT 42 - Nickel Sulfur Strike
Component: **oz/gal Boric Acid**
For Dates: 2/18/2016 9:22 AM - 5/27/2016 7:32 AM
Options: Overview | X-Bar | Run | Histogram | Settings

Run Chart



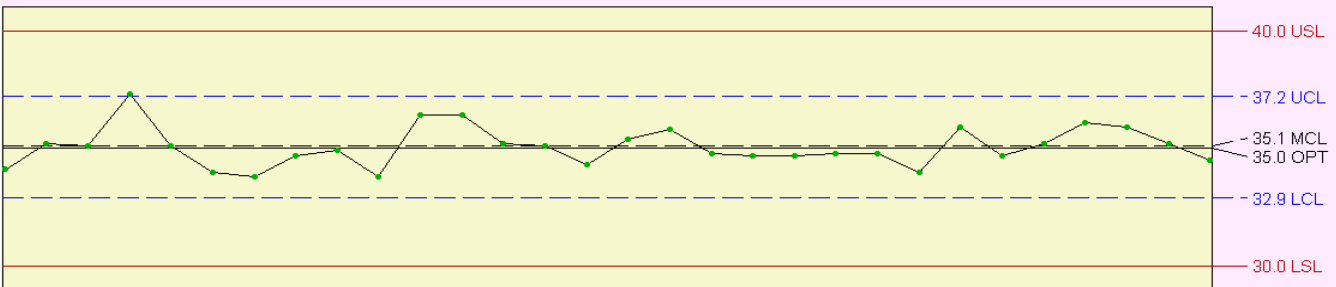
Tank: HT 42 - Nickel Sulfur Strike
Component: **oz/gal Nickel Chloride**
For Dates: 2/18/2016 9:22 AM - 5/27/2016 7:32 AM
Options: Overview | X-Bar | Run | Histogram | Settings

Run Chart



Tank: HT 42 - Nickel Sulfur Strike
Component: **oz/gal Nickel Sulfate**
For Dates: 2/18/2016 9:22 AM - 5/27/2016 7:32 AM
Options: Overview | X-Bar | Run | Histogram | Settings

Run Chart

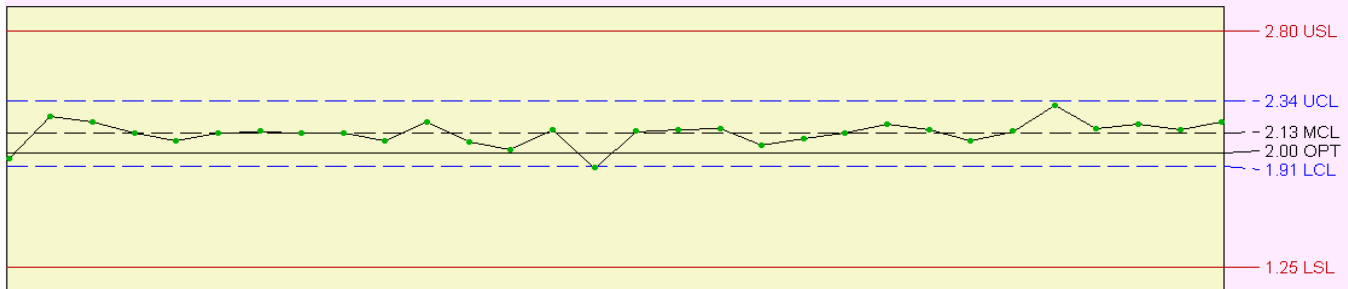


Reduced Monitoring Justification

Decorative Plating: Chrome Tank Concentrations

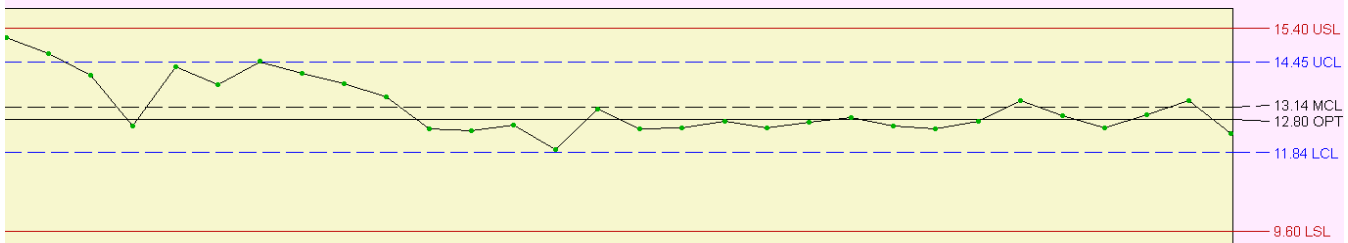
Tank: HT 52 - Chrome (II) TriMac
Component: oz/gal Chromic Acid
For Dates: 9/18/2015 5:33 AM - 5/27/2016 7:32 AM
Options
Overview | X-Bar | Run | Histogram | Settings

Run Chart



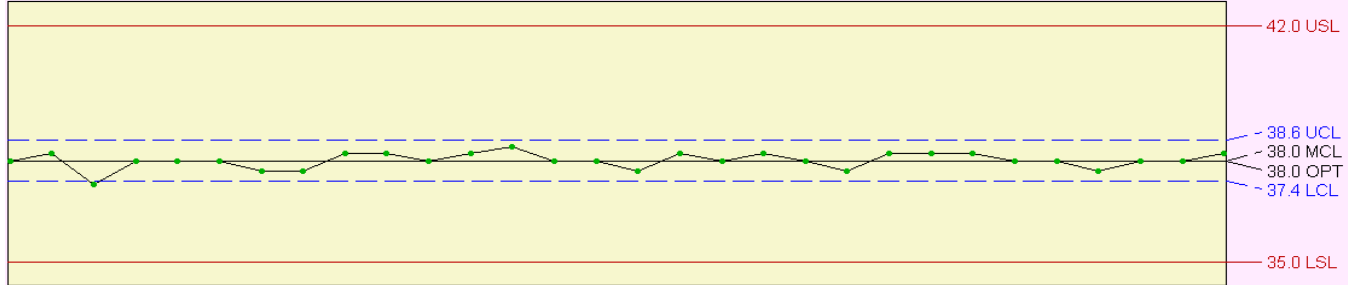
Tank: HT 53 - Chrome (II) Starlite
Component: oz/gal Twilite Part A
For Dates: 10/9/2015 4:23 AM - 6/6/2016 11:19 AM
Options
Overview | X-Bar | Run | Histogram | Settings

Run Chart



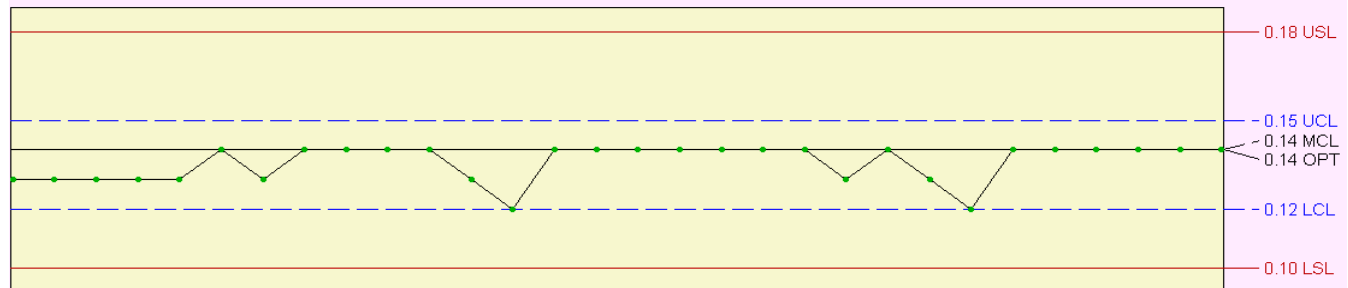
Tank: HT 57 - Chrome (VI)
Component: oz/gal Chromic Acid
For Dates: 5/5/2016 11:16 PM - 5/27/2016 12:26 PM
Options
Overview | X-Bar | Run | Histogram | Settings

Run Chart



Process: Hoist Line
Tank: HT 57 - Chrome (VI)
Component: oz/gal Sulfates
For Dates: 5/5/2016 11:16 PM - 5/27/2016 12:26 PM
Options
Overview | X-Bar | Run | Histogram | Settings

Run Chart

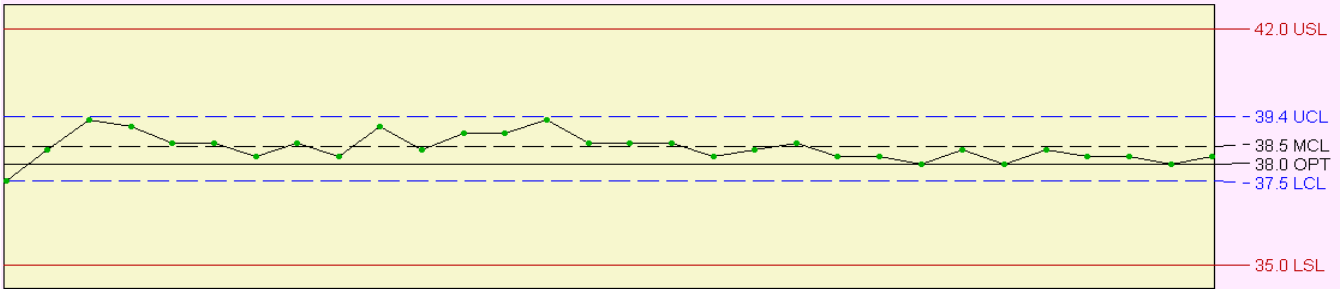


Reduced Monitoring Justification

Chrome Tank Concentrations (cont.)

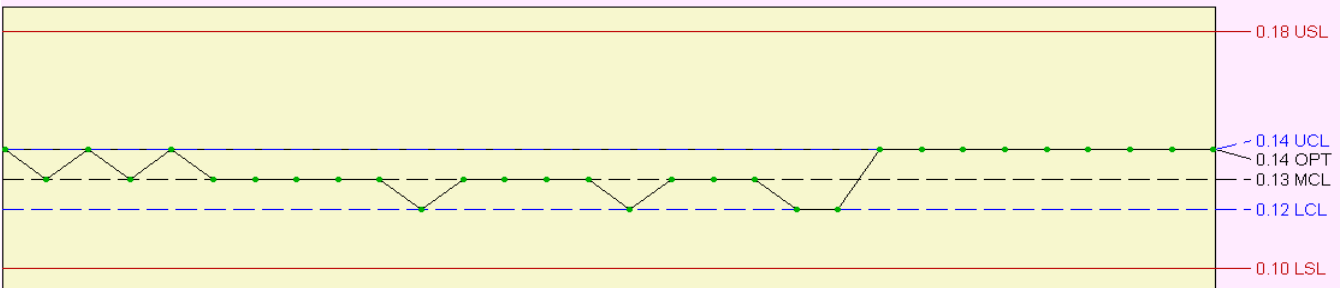
Tank: HT 58 - Chrome (VI) Options
Component:
For Dates: ... Overview X-Bar Run Histogram Settings

Run Chart



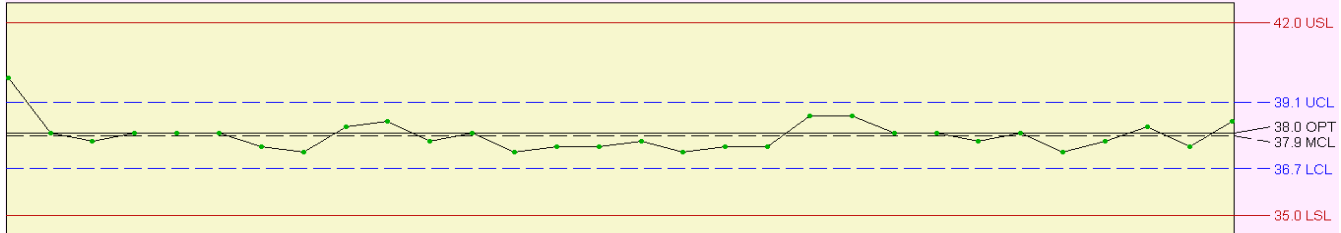
Tank: HT 58 - Chrome (VI) Options
Component:
For Dates: ... Overview X-Bar Run Histogram Settings

Run Chart



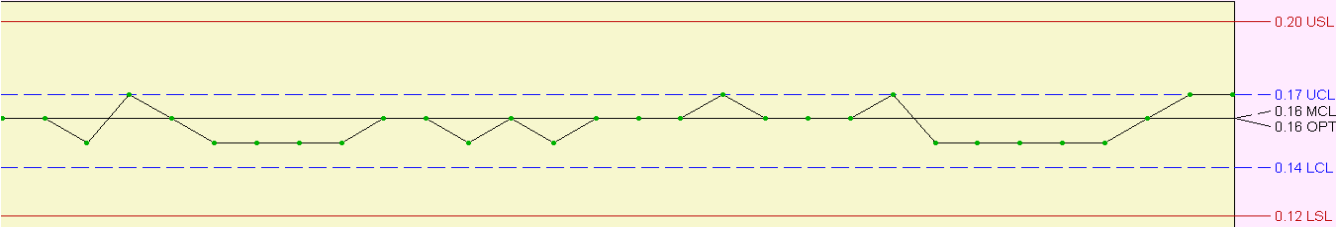
Tank: CT 23 - Chrome (VI) Options
Component:
For Dates: ... Overview X-Bar Run Histogram Settings

Run Chart



Tank: CT 23 - Chrome (VI) Options
Component:
For Dates: ... Overview X-Bar Run Histogram Settings

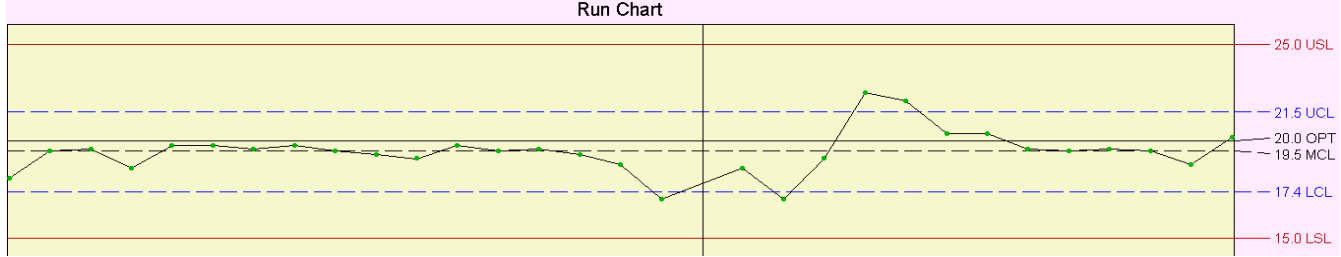
Run Chart



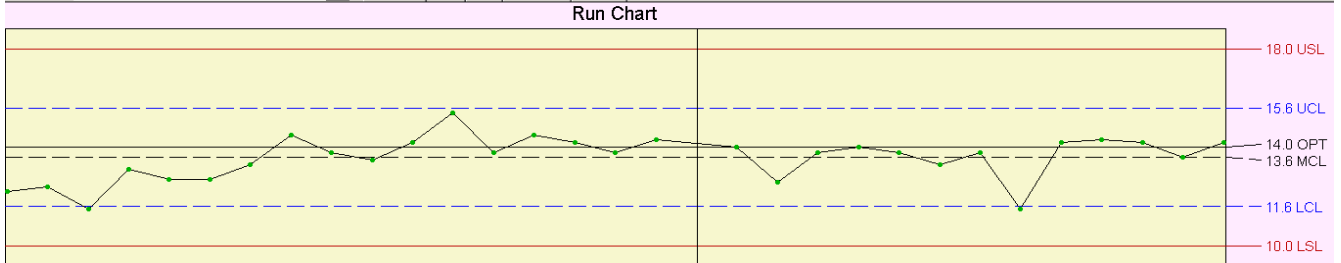
Reduced Monitoring Justification

Surface Prep: Acid Concentrations

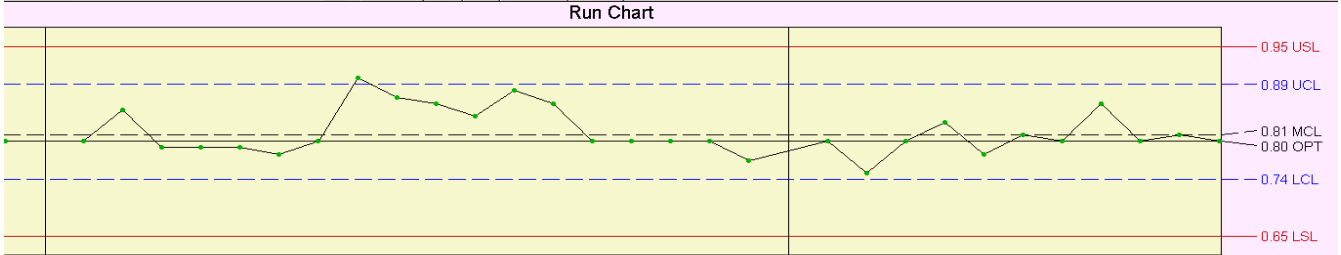
Tank: CT 05 - Acid Clean Options
Component: 0z/gal HP Acidsalt FLWET
For Dates: 5/10/2016 3:16 AM - 6/1/2016 7:27 AM Overview X-Bar Run Histogram Settings



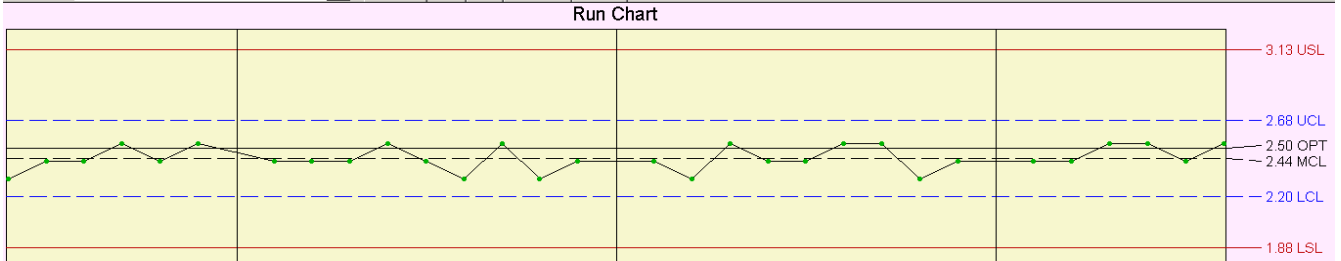
Tank: CT 06 - Acid Clean Options
Component: 0z/gal HP Acidsalt FLWET
For Dates: 5/10/2016 3:19 AM - 6/1/2016 7:28 AM Overview X-Bar Run Histogram Settings



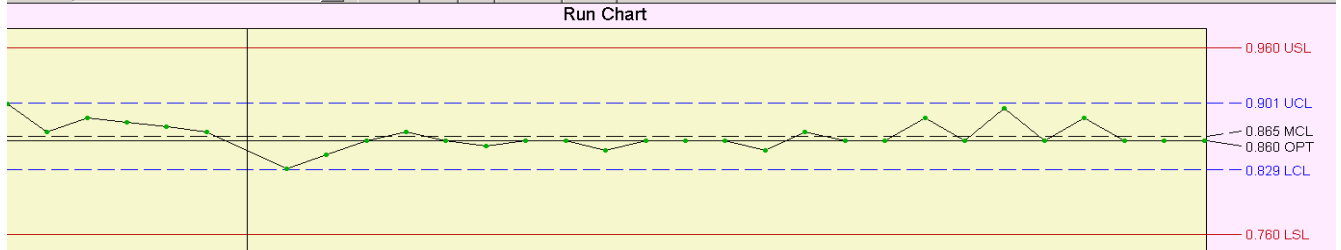
Tank: CT 14 - Electro Acid Options
Component: N Total Acid
For Dates: 5/10/2016 3:30 AM - 6/1/2016 7:29 AM Overview X-Bar Run Histogram Settings



Tank: HT 08 - Acid Dip Options
Component: %vol HP Blend
For Dates: 5/11/2016 1:41 AM - 6/2/2016 6:51 AM Overview X-Bar Run Histogram Settings



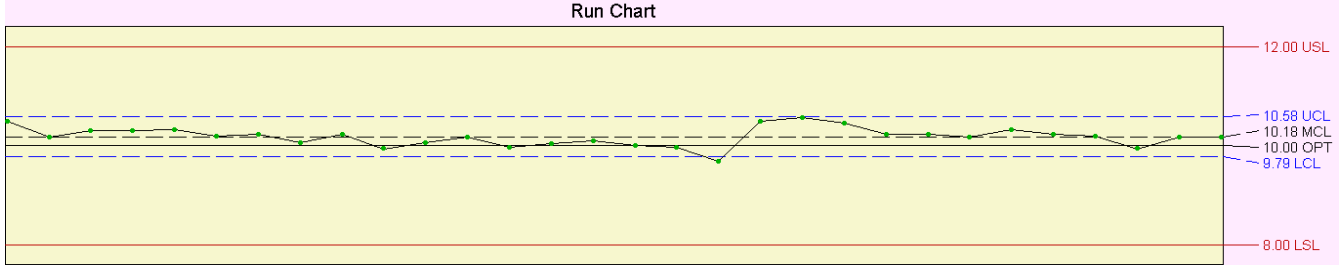
Tank: HT 09 - Acid Pickle Options
Component: N Total Acid
For Dates: 5/11/2016 1:43 AM - 6/2/2016 6:52 AM Overview X-Bar Run Histogram Settings



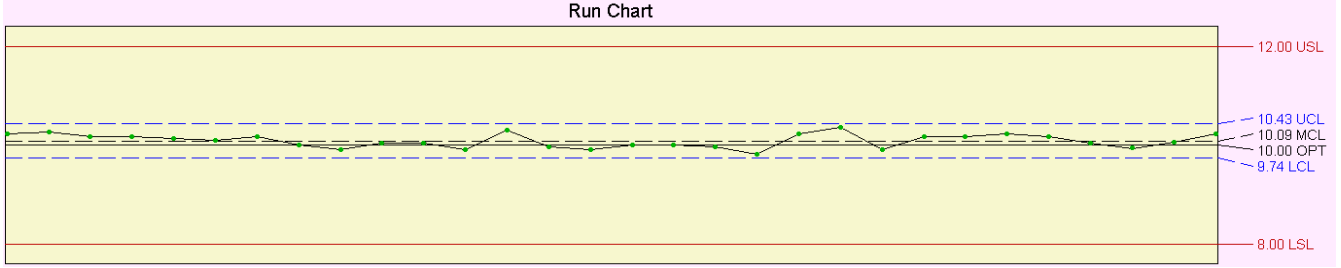
Reduced Monitoring Justification

acids cont.

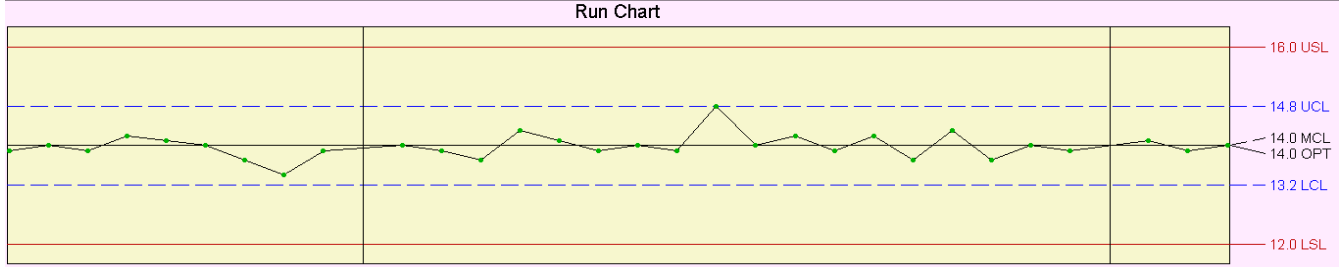
Tank: HT 19 - Acid Copper
Component: % vol Sulfuric Acid
For Dates: 5/10/2016 6:55 AM - 6/2/2016 7:06 AM
Overview | Bar | Run | Histogram | Settings



Tank: HT 20 - Acid Copper
Component: % vol Sulfuric Acid
For Dates: 5/11/2016 1:03 AM - 6/2/2016 7:14 AM
Overview | Bar | Run | Histogram | Settings



Tank: HT 30 - Acid Dip
Component: 62/gal Metex M-629
For Dates: 5/9/2016 7:08 AM - 6/2/2016 7:35 AM
Overview | Bar | Run | Histogram | Settings



Tank: HT 31 - Electro Acid Pickle
Component: N Total Acid
For Dates: 4/19/2016 7:16 AM - 6/2/2016 7:37 AM
Overview | Bar | Run | Histogram | Settings

