



Autosplice Plating Supplier Survey

93-0504 Rev A

Audit/Qualification Guideline:

Application: Sub Contract Plating vendor Qualification for ROHS Compliant Plating.

Scope/Objective:

- To identify the electro plating sub contractor readiness/suitability for ROHS compliant engineered plating.
- To deliver a plan for qualifying RoHS compliance of plating as submitted by plating house.
- The supplier, bath, chemistry, impurity concentration and QAP are to be standardized at the end of qualification.
- Any deviation from the declarations in this qualification document will require Autosplice engineering approval.

Survey completed by Name/Title	Date	Telephone Number:	Email Address



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Organization Details

1.1 GENERAL INFORMATION

Company Name:		Commodity:	
Physical Address			
City	State/Province	Zip Code	Country
Telephone Number:	FAX Number		
Email Address	Web Site		Date Founded <input type="checkbox"/> Public <input type="checkbox"/> Private
Assessment Type: <input type="checkbox"/> Initial <input type="checkbox"/> Follow-Up <input type="checkbox"/> Surveillance	Years Supplying to Autosplice:		Audit Date:

1.2 MANAGEMENT

President	Telephone Number:	Email Address
Chief Operating Officer	Telephone Number:	Email Address
Engineering	Telephone Number:	Email Address
Quality	Telephone Number:	Email Address
Manufacturing	Telephone Number:	Email Address
Marketing/Sales	Telephone Number:	Email Address
Customer Services		Email Address

CORPORATE

DESCRIPTION	NUMBER OF EMPLOYEES		COMMENTS
	CORPORATE	LOCATION	
Research and Development			
Manufacturing Control			
Manufacturing	Direct		
	Indirect		
Quality Assurance	Quality Engineer		
	Quality Auditor		
	Others		
Administration			
Total			



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2. Manufacturing Site/Facility Description.						
Structure	Age	Heat	Vent	A/C	Sprinklers	Waste Trt
Admin						
Factory 1						
Factory 2						
Warehouse						

2.1 Safety And regulatory Agency Requirements.	
Conformance to local/federal EPA requirements?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Date of Last OSHA/EPA visit?	
Operation conducted under any environmental waiver?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does a safety program exist?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Describe or attach referencing document.	

3. Plating Details								
	Reel To Reel		Rack- Complete Surface		Rack- selective		Barrel	
	Yes	No	Yes	No	Yes	No	Yes	No
Plating								
Matte Ni	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bright Ni	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Matte Cu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bright Cu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cu Flash	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Matte Sn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bright Sn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sn/Pb 93/7 -Matte	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sn/Pb 93/7 -Bright	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pd	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pd-Ni	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Au-Pd-Ni	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immersion Au	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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3.1 Process / Plating

Setup Details:				
Reel to Reel Plating	Number of Lines	Dedicated Bath/tank	Dedicated line	Sn and Sn Pb lines separate?
Ni			NA	NA
Au			NA	NA
Matte Sn				<input type="checkbox"/> Yes <input type="checkbox"/> No
Matte Sn/Pb				<input type="checkbox"/> Yes <input type="checkbox"/> No
Bright Sn				<input type="checkbox"/> Yes <input type="checkbox"/> No
Bright Sn/Pb				<input type="checkbox"/> Yes <input type="checkbox"/> No

3.2 Chemistry Process Control

What group or department controls plating bath chemistry?

What group or department controls plating bath chemistry?

Are analyses procedures written, documented and available for review?

What analyses are conducted for plating chemistry control?

Analytical equipment availability check:

Equipment Type	Yes	No	Comments
X-ray Fluorescence (XRF)	<input type="checkbox"/>	<input type="checkbox"/>	Advertised accuracy +/-0.05%, +/-2% etc Accuracy= %
ICP	<input type="checkbox"/>	<input type="checkbox"/>	
Atomic Absorption	<input type="checkbox"/>	<input type="checkbox"/>	
SEM-EDX	<input type="checkbox"/>	<input type="checkbox"/>	
Wet Analysis	<input type="checkbox"/>	<input type="checkbox"/>	
Cross Section with Microscopic Exam	<input type="checkbox"/>	<input type="checkbox"/>	
40X	<input type="checkbox"/>	<input type="checkbox"/>	
100X	<input type="checkbox"/>	<input type="checkbox"/>	
200X	<input type="checkbox"/>	<input type="checkbox"/>	
400X	<input type="checkbox"/>	<input type="checkbox"/>	
1000X	<input type="checkbox"/>	<input type="checkbox"/>	
Beta Backscatter	<input type="checkbox"/>	<input type="checkbox"/>	
Gravimetric Analysis	<input type="checkbox"/>	<input type="checkbox"/>	



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Chemistry Control Staff			
Manager			
Chemists:			
Technicians:			
What is the frequency of chemistry monitor and control?	<input type="checkbox"/> Shift	<input type="checkbox"/> No of Prodn Days/Hrs	
	<input type="checkbox"/> Other (details)		
Analyses done per chemistry supplier recommendations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
How are chemistry additions done?			
Are solutions filtered, dummied, temperature controlled etc. as required per GMP?	<input type="checkbox"/> Yes - Detail:	<input type="checkbox"/> No	
Are rectifiers checked periodically for AC?	<input type="checkbox"/> Yes - Detail:	<input type="checkbox"/> No	
For Matte Sn plating, describe Sn plating stress control?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
For matte Sn plating, what is the stress relief procedure adopted	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
For matte Sn stress relief, can the following be applied:			
• 150C for 1 Hr	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• 150C for 2 Hr	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Detail the porosity testing conducted.			
Solderability test methods availability: (J-std 002B Cat 1,2,3; Mil-STD-202G Method 208 etc.)			
Describe the cleaning and rinsing methods employed:			
Plating Specifications:			
Gold	MIL-G-45204, ASTM B488	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Palladium	ASTM B 679	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Nickel	ASTM B 689, QQ-N-290	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Electroless nickel	ASTM B733	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Tin	ASTM B 545, MIL-T-10727	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Tin/Lead	MIL-P-81728, ASTM B 579	<input type="checkbox"/> Yes	<input type="checkbox"/> No



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4. Process Equipment and QA

QUALITY DEVELOPMENT		
SPC procedures in place and used regularly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Quality manual available to employees and customers?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Supplier quality requirements documented?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Training records available for review?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Customer product sampling plans		
<input type="checkbox"/> Default ...identify governing spec/ref		
<input type="checkbox"/> "As requested"		
Retains kept?	<input type="checkbox"/> Yes, For what period of time?	<input type="checkbox"/> No
Traceability to plating line and time-frame?		
Explain traceability Process		
Travelers kept for records/traceability?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
For what period of time?		
PROCESS EQUIPMENT		
Plating lines by type		
Analytical equipment by type.		
Waste treatment system(s) by type		

5. RoHS Compliance Documentation

5.1 Sn Whisker Mitigation efforts:
What Sn whisker mitigation studies have been done in house for Matte Sn Plating? JEDEC Spec: JESD22A121 conformance
What Whisker mitigation studies have been done by the chemistry supplier for the bath?
Attach the report/studies?
Has the plating facility been audited by the chemistry supplier for compliance to plating recommendations?
Have studies been conducted to co-relate the plating bath Pb content to plated Pb content?
If Not when is that expected? Chemistry supplier recommendations available and being adhered to?
What procedures are developed for bath cleanliness and switch over from Sn/Pb to Matte Sn?
What is the sequential plating flow, through dedicated bath lines (Ni+ Sn+ Sn/Pb) or (Ni+Sn/Pb+ Sn)?



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5.2 Material and Elemental reporting

Would you be set up for Matl declaration of banned substances per the ROHS directive with each production lot?

Could you be setup for electronic reporting, via industry developing protocols?

Would lot records of plated parts be available for 10 years?

6.0 RoHS Compliant Plating Qualification Plan

6.1 Prior to Sample Run:

Prior to sample run plating house must meet the requirements of section 5.1. If the information is not available, a plan of action to provide the information per 5.1 must be supplied and approved by Autosplice supplier development engineering

6.1.1 Plating Bath Information: Sn bath

Chemistry Supplier Name

Chemistry Name

Chemistry Concentration: as required by supplier

Acid Supplier:

Acid Name

Anode Supplier:

Anode Name:

Certificate of conformance: All lots of materials used must have their certification of compliance available and submitted to A/S.

Impurity Concentration data from previous 6 months/ equivalent shifts

6.1.2 Plating Bath Information: Ni bath

Chemistry Supplier Name

Chemistry Name

Chemistry Concentration: as required by supplier

Acid Supplier:

Acid Name

Anode Supplier:

Anode Name:

Certificate of conformance: All lots of materials used must have their certification of compliance available and submitted to A/S.

6.1.3 Impurity Concentration data from previous 6 months/ equivalent shifts

6.1.4 Sample Run:

6.1.4.1 Plating Bath Control:

Chemical Concentration of the bath as used in qualification run

Chemical concentration at end of qualification plating run

Chemical concentration control during plating run

Pick three time series during planned production run and measure the alloy and impurity concentration.



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6.1.5 Post Plating:

Validate that the plating bath has deposited plating compliant with RoHS directive **2002/95/EC**.

6.1.5.1 Conduct a SEM, validation of plating contents in each homogenous layer of plating. The plating composition should meet the A/S spec 044 and RoHS banned substances directive.

Plating vendor (mandatory): Mandatory to conduct SEM and provide report to A/S

Autosplice Customer: (Optional): Autosplice customer may do an optional SEM analysis when the effort is customer co-ordinated

Autosplice validation of plating vendor results. (optional): Autosplice may do a material analysis as part of the qualification run or may do it on a production part at a later date.

In lieu of SEM, AA by dissolving the individual plating layers may suffice if the desired accuracy, precision and discrimination is demonstrated in the equipment.

6.1.6 Analysis of Results

Provision of documentation per section 5.1 and information per section 6 along with test reports is primary to plater qualification.

If the documentation is supplied and test results meet the A/S spec 044 and RoHS banned substances requirements, the vendor will be considered and certified and qualified for Pb free plating.

Vendor approval for production will follow normal supplier development practices of A/S.