



ASSOCIATION CONNECTING  
ELECTRONICS INDUSTRIES®

# IPC-1710A

## OEM Standard for Printed Board Manufacturers' Qualification Profile

Developed by the OEM council of the IPC, the MQP sets the standard for assessing PWB manufacturers capabilities and allows PWB manufacturers to more easily satisfy customer requirements.

**IPC-1710A**  
May 2004

**A standard developed by IPC**

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The material in this standard was developed by the OEM Council of the Institute for Interconnecting and Packaging Electronic Circuits.

## **FOREWORD**

It is not intended that this Manufacturers' Qualification Profile (MQP) satisfies all the requirements of the customer, however, conscientious maintenance of this document and or registration to ISO 9000 requirements should satisfy the major concerns. Thus, audits should be simpler, required less frequently, and facilitate less paper work as customers and suppliers work closer to meeting each others needs.

## **ACKNOWLEDGMENTS**

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# SECTION 1.1

## COMPANY DESCRIPTION

DATE COMPLETED December 10, 2007
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GENERAL INFORMATION			
LEGAL NAME PNC, Inc.			
PHYSICAL ADDRESS 115 E Centre St.			
CITY Nutley	STATE New Jersey	ZIP 07110	
PROVINCE	COUNTRY USA		
TELEPHONE NUMBER 973-284-1600	FAX NUMBER 973-284-1925	TELEX NUMBER	
sales@pnconline.com	MODEM NUMBER	DATE FOUNDED 1966 <input type="checkbox"/> PUBLIC <input checked="" type="checkbox"/> PRIVATE	
INTERNET URL www.pnconline.com	www.pnconline.com		

MANAGEMENT
PRESIDENT Peter Patel
CHIEF OPERATING OFFICER Peter Patel
VICE PRESIDENT OF MANUFACTURING Sam Sangani
QUALITY MANAGER Michael Turcotte
MARKETING/SALES MANAGER Carmela Conte
CUSTOMER SERVICE MANAGER Janine Likos
WASTE TREATMENT MANAGER (POLLUTION PREVENTION) Angus Watson

CORPORATE DESCRIPTION	NUMBER OF EMPLOYEES		COMMENTS
	CORPORATE	SITE	
DESIGN AND DEVELOPMENT		0	
ENGINEERING		4	
MANUFACTURING CONTROL		2	
MANUFACTURING	DIRECT	16	
	INDIRECT	6	Working Supervisors
QUALITY CONTROL	QUALITY INSPECTORS	7	
	INTERNAL AUDITORS	6	Part Time
	GENERAL MANAGEMENT	3	
ADMINISTRATION	1	5	
<b>TOTAL</b>	<b>1</b>	<b>49</b>	

# SECTION 1.2

## SITE DESCRIPTION

(TO BE COMPLETED FOR EACH SITE)

DATE COMPLETED 12-10-07  
ATTACH APPROPRIATE CHARTS (OPTIONAL)

MANUFACTURING FACILITY			
COMPANY NAME	PNC, Inc.		
PHYSICAL ADDRESS	115 East Centre Street		
CITY	Nutley	STATE	NJ
		ZIP	07110
PROVINCE		COUNTRY	USA
TELEPHONE NUMBER	973-284-1600	FAX NUMBER	973-284-1925
		TELEX	
E-MAIL ADDRESS	sales@pnconline.com	MODEM NUMBER	YEARS IN BUSINESS 38
INTERNET URL	sales@pnconline.com	FTP	sales@pnconline.com
PRINCIPLE PRODUCTS/SERVICES/SPECIALTIES	BUSINESS CHARACTERIZATION (HIGH VOLUME, QUICK TURN-AROUND, ETC.)		
Printed Circuit Boards & Laser Cut Stencils	Mid volume and quick turn printed circuit boards		
Multilayer, Buried & Blind Vias, RoHS compliant			

FACILITY MANAGEMENT	TITLE	REPORTS TO (Function/Job Title)
OVERALL OPERATION RESPONSIBILITY FOR THIS SITE Sam Sangani	Vice President, General Manager	Peter Patel, President, CEO
MANUFACTURING Tracy Kite	Manufacturing Manager	Sam Sanagai, VP
TECHNICAL/ENGINEERING LaLo Patel	Engineering Manager	Sam Sangani, VP
MATERIALS/PRODUCTION CONTROL Tracy Kite	Manufacturing Manager	Sam Sangani, VP
PURCHASING Janine Likos	Purchasing Manager	Sam Sangani, VP
QUALITY Michael Turcotte	Quality Manager	Peter Patel, President, CEO
SALES REPRESENTATIVE Chris Trusinsky	National Sales Manager	Sam Sangani, VP
WASTE MANAGEMENT Angus Watson	Chemist	Sam Sangani

	SYSTEMS (INDICATE % COVERAGE)									
	AGE	AREA (Sq. Ft.)	Construction (Wood/Brick)	Power Conditioning	Heating	Ventilation	Air Conditioning	Sprinklers	Waste Treatment	Other
Office	28	6,000	Cinder block	100	100	100	100	0	0	
Manufacturing	28	29,000	Cinder block	100	100	100	100	100	100	
Storage	28	2,000	Cinder block	100	100	100	100	100	0	
Planned additions	0									

SAFETY AND REGULATORY AGENCY REQUIREMENTS			
Are fire extinguishers functional and accessible to employees?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	What is the distance to the nearest fire station? (in minutes) 5 Minutes
Do you conform to local/federal environment protection agency requirements?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	Date of last OSHA visit 8-19-03 Date of last EPA visit 2-08-07
Are you currently operating under a waiver or in violation of local government requirements?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	Other Agency Audits, UL, ISO 9000, NECQ, CSA Approval and Number UL # E44831 <input type="checkbox"/> ISO 9000:2000 BSI <input type="checkbox"/> CSA # _____ <input type="checkbox"/> FM53681 <input type="checkbox"/> Other _____
Do you have a safety program? Describe below.	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	Hazardous Waste Number Trade Waste Account Number

PLANT PERSONNEL (TOTAL EMPLOYEES)										
Regular	Contract	Office	Technical/Engineering	Production	Full-Time QA	Part-Time QA	Union	Non-Union	Union Name	Contract Expires (Date)
46	0	5	5	22	14	0	0	46		

COMMENTS

# SECTION 2.1

## PROCESS

DATE COMPLETED  
12-10-07

This section is intended to provide overview information on the processes used to fabricate printed board products.

### Site Capability Snapshot (Please Check all that apply)

Designators			Remarks
A	Conductor Forming Processes	<input checked="" type="checkbox"/> Subtractive <input type="checkbox"/> Thin Foil Subtractive less than .5 oz. <input checked="" type="checkbox"/> Semi-Additive <input checked="" type="checkbox"/> Additive (Electro-less) <input type="checkbox"/> Black Hole <input type="checkbox"/> Thick Film Paste and Fire <input type="checkbox"/> Thin Film Semi-conductor Sputtering <input type="checkbox"/> Other:	
B	PTH Materials and Processes	<input checked="" type="checkbox"/> Acid Copper <input type="checkbox"/> Pyro-Phosphate Copper <input type="checkbox"/> Full Built Electro-Less <input type="checkbox"/> Gold Paste <input type="checkbox"/> Copper Paste <input type="checkbox"/> Gold Conductor Sputtering <input type="checkbox"/> Nickel Conductor Sputtering <input type="checkbox"/> Other:	
C	Permanent Over-plating	<input type="checkbox"/> Tin <input type="checkbox"/> Tin-Lead <input type="checkbox"/> Tin-Nickel Alloy <input type="checkbox"/> Nickel <input checked="" type="checkbox"/> Nickel Gold (Hard) <input checked="" type="checkbox"/> Nickel Gold (Soft) <input type="checkbox"/> Nickel Rhodium <input type="checkbox"/> Conductive Polymer <input type="checkbox"/> Other:	

D	Permanent Selective Plating	<input type="checkbox"/> Tin <input type="checkbox"/> Tin-Lead <input type="checkbox"/> Tin-Nickel Alloy <input type="checkbox"/> Nickel <input checked="" type="checkbox"/> Nickel Gold (Hard) <input checked="" type="checkbox"/> Nickel Gold (Soft) <input type="checkbox"/> Nickel Rhodium <input type="checkbox"/> Other:	outside service
E	Permanent Mask or Coating	<input type="checkbox"/> Photo Dry Film <input type="checkbox"/> Photo Liquid <input checked="" type="checkbox"/> Image Transfer Screen Mask <input type="checkbox"/> Conformal Coating Solder Mask <input type="checkbox"/> Cover Coat <input checked="" type="checkbox"/> Other: Conductive Carbon	Liquid Photo Imagable  Screen application
F	Other Surface Finishes	<input type="checkbox"/> Tin-Lead Fused <input checked="" type="checkbox"/> Immersion Tin <input checked="" type="checkbox"/> Solder Leveled <input type="checkbox"/> Roll Soldered <input type="checkbox"/> Electro-less Solder Fused <input type="checkbox"/> Solder Bumped Lands <input type="checkbox"/> Solder Paste Fused <input checked="" type="checkbox"/> Azole Organic Protective Covering <input type="checkbox"/> Flux Protective Covering <input checked="" type="checkbox"/> Other: ENIG, Immersion Silver	

# SECTION 2.2

## ELECTRICAL TEST EQUIPMENT

DATE COMPLETED  
12-10-07

This section is intended to provide overview information on the test equipment and testing capability of the manufacturer.

Site Capability Snapshot (Please Check the column that applies furthest to the right.)

Designators			Remarks
A	Number of Nets	<input type="checkbox"/> <200 <input type="checkbox"/> 200 <input type="checkbox"/> 500 <input type="checkbox"/> 1000 <input type="checkbox"/> 2000 <input type="checkbox"/> 3000 <input type="checkbox"/> 4000 <input type="checkbox"/> 5000 <input checked="" type="checkbox"/> >5000 <input type="checkbox"/> Other:	
B	Number of Nodes	<input type="checkbox"/> <500 <input type="checkbox"/> 500 <input type="checkbox"/> 1000 <input type="checkbox"/> 2000 <input type="checkbox"/> 3000 <input type="checkbox"/> 4000 <input type="checkbox"/> 5000 <input type="checkbox"/> 6000 <input checked="" type="checkbox"/> >6000 <input type="checkbox"/> Other:	
C	Probe Point Pitch	<input type="checkbox"/> >1.0 [.040] <input type="checkbox"/> 1.0 [.040] <input type="checkbox"/> 0.8 [.032] <input type="checkbox"/> 0.65 [.025] <input type="checkbox"/> 0.50 [.020] <input type="checkbox"/> 0.40 [.016] <input type="checkbox"/> 0.30 [.012] <input type="checkbox"/> 0.20 [.008] <input checked="" type="checkbox"/> <0.20 [.008] <input type="checkbox"/> Other:	

D	Test % Single Pass	<input type="checkbox"/> None <input type="checkbox"/> <60% <input type="checkbox"/> 60% <input type="checkbox"/> 70% <input type="checkbox"/> 80% <input type="checkbox"/> 90% <input type="checkbox"/> 95% <input type="checkbox"/> 99% <input checked="" type="checkbox"/> 100% <input type="checkbox"/> Other:	
E	Probe Accuracy (DTP)	<input type="checkbox"/> >0.2 [.008] <input type="checkbox"/> 0.2 [.008] <input type="checkbox"/> 0.15 [.006] <input type="checkbox"/> 0.125 [.005] <input type="checkbox"/> 0.1 [.004] <input type="checkbox"/> 0.075 [.003] <input checked="" type="checkbox"/> <0.075 [.003] <input type="checkbox"/> Other:	
F	Grid Density	<input type="checkbox"/> Single Side Grid <input type="checkbox"/> Double Sided Grid <input type="checkbox"/> Double Density Grid <input type="checkbox"/> Double Density Double Sided <input type="checkbox"/> Quad Density <input type="checkbox"/> Double Sided Quad Density <input checked="" type="checkbox"/> Flying Probe <input type="checkbox"/> Other:	
G	Netlist Capability	<input checked="" type="checkbox"/> Golden Board <input checked="" type="checkbox"/> IPC-D-356 <input checked="" type="checkbox"/> Net List Extraction <input checked="" type="checkbox"/> CAD/CAM Net List Compare <input type="checkbox"/> Other:	

<p>H</p>	<p>Test Voltage</p>	<p><input type="checkbox"/> &lt;20 VDC  <input type="checkbox"/> 20 VDC  <input type="checkbox"/> 40 VDC  <input type="checkbox"/> 60 VDC  <input type="checkbox"/> 80 VDC  <input type="checkbox"/> 100 VDC  <input checked="" type="checkbox"/> 500 VDC  <input type="checkbox"/> 1000 VDC  <input type="checkbox"/> &gt;1000 VDC  <input type="checkbox"/> Other:</p>	
<p>J</p>	<p>Impedance Meas</p>	<p><input checked="" type="checkbox"/> Micro Section  <input type="checkbox"/> Inboard Circuit  <input checked="" type="checkbox"/> Coupon  <input checked="" type="checkbox"/> Manual TDR  <input type="checkbox"/> Automated TDR  <input type="checkbox"/> Other:</p>	
<p>K</p>	<p>Impedance Tolerance</p>	<p><input type="checkbox"/> None  <input type="checkbox"/> &gt;20%  <input type="checkbox"/> 20%  <input type="checkbox"/> 15%  <input type="checkbox"/> 10%  <input type="checkbox"/> 7%  <input checked="" type="checkbox"/> 5%  <input type="checkbox"/> 2%  <input type="checkbox"/> &lt;2%  <input type="checkbox"/> Other:</p>	

# SECTION 2.3

## PRODUCT TYPE

DATE COMPLETED 12-10-07
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This section is intended to provide overview information on the printed board product types being fabricated by the manufacturer.

### Site Capability Snapshot (Please Check all that apply.)

Designators			Remarks
A	Product Type	<input checked="" type="checkbox"/> Rigid Printed Board <input type="checkbox"/> Flex Printed Board <input type="checkbox"/> Rigid/Flex Board <input checked="" type="checkbox"/> Rigid Back Plane <input type="checkbox"/> Molded Product <input checked="" type="checkbox"/> Ceramic Printed Board <input type="checkbox"/> Multichip Module <input type="checkbox"/> Laminated Multichip Module <input type="checkbox"/> Deposited Dielectric Multichip Modules <input type="checkbox"/> Other:	
B	Circuit Mounting Type	<input checked="" type="checkbox"/> Single Sided <input checked="" type="checkbox"/> Double Sided <input checked="" type="checkbox"/> Multilayer <input type="checkbox"/> Single-sided Bonded to Substrate <input type="checkbox"/> Double-sided Bonded to Substrate <input type="checkbox"/> Multilayer Bonded to Substrate <input type="checkbox"/> Constrained Multilayer <input type="checkbox"/> Distributed Plane Multilayer <input type="checkbox"/> Other:	
C	Via Technology	<input type="checkbox"/> No-Vias <input checked="" type="checkbox"/> Thru Hole Vias <input checked="" type="checkbox"/> Buried Vias <input checked="" type="checkbox"/> Blind Vias <input checked="" type="checkbox"/> Thru Hole & Blind Vias <input checked="" type="checkbox"/> Thru Hole & Buried Vias <input checked="" type="checkbox"/> Thru Hole Buried & Blind Vias <input checked="" type="checkbox"/> Buried & Blind Vias <input type="checkbox"/> Other:	

D	Laminate Material	<input checked="" type="checkbox"/> Phenolic <input type="checkbox"/> Epoxy Paper <input checked="" type="checkbox"/> Epoxy Glass <input checked="" type="checkbox"/> Modified Epoxy Composite <input type="checkbox"/> Polyimide Film & Reinforce <input checked="" type="checkbox"/> Cyanate Ester <input checked="" type="checkbox"/> Teflon <input checked="" type="checkbox"/> Ceramic Glass Types <input type="checkbox"/> Various Combinations <input checked="" type="checkbox"/> Other: Non-Diccy Epoxy-Phenolic	Rogers 3000 series Rogers 4000 series  ISOLA 370HR
E	Core Material	<input type="checkbox"/> No Core <input type="checkbox"/> Polymer <input checked="" type="checkbox"/> Copper <input type="checkbox"/> Aluminum <input type="checkbox"/> Graphite <input type="checkbox"/> Copper Invar/Copper <input type="checkbox"/> Copper Moly/Copper <input type="checkbox"/> Other:	
F	Copper Thickness (Oz.)	<input type="checkbox"/> 1/8 Minimum <input type="checkbox"/> 1/4 Minimum <input type="checkbox"/> 3/8 Minimum <input checked="" type="checkbox"/> 1/2 Nominal <input checked="" type="checkbox"/> 1 Nominal <input checked="" type="checkbox"/> 2 Nominal <input checked="" type="checkbox"/> 3-5 Max <input type="checkbox"/> 6-9 Max <input type="checkbox"/> >10 <input type="checkbox"/> Other:	
G	Construction	<input type="checkbox"/> ≤4 Planes <input type="checkbox"/> >4 Planes <input checked="" type="checkbox"/> THK to TOL ≤0.2 mm <input type="checkbox"/> THK to TOL >0.2 mm <input checked="" type="checkbox"/> Bow/Twist ≤1% <input type="checkbox"/> Bow/Twist >1% <input type="checkbox"/> ≤0.3 mm Profile Tolerance <input checked="" type="checkbox"/> 0.3 mm Profile Tolerance <input type="checkbox"/> Other:	

H	Coatings and Markings	<input checked="" type="checkbox"/> $\leq 0.1$ mm Mask Clearance <input type="checkbox"/> $> 0.1$ mm Mask Clearance <input checked="" type="checkbox"/> One Side (Legend) <input checked="" type="checkbox"/> Two Side (Legend) <input type="checkbox"/> None (Legend) <input type="checkbox"/> UL Material Logo <input checked="" type="checkbox"/> U.L. V <sub>0</sub> Logo <input type="checkbox"/> U.L. V <sub>1</sub> Logo <input type="checkbox"/> U.L. V <sub>2</sub> Logo <input type="checkbox"/> Other:	
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# SECTION 2.4

## PRODUCT COMPLEXITY

DATE COMPLETED  
12-10-076

This section is intended to provide overview information on product complexity being fabricated by the manufacturer.

(Please check the column that applies farthest to the right)

Designators			Remarks
A	Board Size Diagonal	<input type="checkbox"/> <250 [10.00] <input type="checkbox"/> 250 [10.00] <input type="checkbox"/> 350 [14.00] <input type="checkbox"/> 450 [17.50] <input type="checkbox"/> 550 [21.50] <input type="checkbox"/> 650 [25.50] <input checked="" type="checkbox"/> 750 [29.50] <input type="checkbox"/> 850 [33.50] <input type="checkbox"/> >850 [33.50] <input type="checkbox"/> Other:	
B	Total Board Thickness	<input type="checkbox"/> 1,0 [.040] <input type="checkbox"/> 1,0 [.040] <input type="checkbox"/> 1,6 [.060] <input type="checkbox"/> 2,0 [.080] <input type="checkbox"/> 2,5 [.100] <input type="checkbox"/> 3,5 [.135] <input checked="" type="checkbox"/> 5,0 [.200] <input checked="" type="checkbox"/> 6,5 [.250] <input type="checkbox"/> >6,5 [.250] <input type="checkbox"/> Other:	
C	Number Conductive Layers	<input type="checkbox"/> 1-4 <input type="checkbox"/> 5-6 <input type="checkbox"/> 7-8 <input type="checkbox"/> 9-12 <input type="checkbox"/> 13-16 <input type="checkbox"/> 17-20 <input checked="" type="checkbox"/> 21-24 <input type="checkbox"/> 25-28 <input type="checkbox"/> >28 <input type="checkbox"/> Other:	

D	Dia Drilled Holes	<input type="checkbox"/> >0,5 [.020] <input type="checkbox"/> 0,5 [.020] <input type="checkbox"/> 0,4 [.016] <input type="checkbox"/> 0,35 [.014] <input type="checkbox"/> 0,30 [.012] <input type="checkbox"/> 0,25 [.010] <input checked="" type="checkbox"/> 0,20 [.008] <input type="checkbox"/> 0,15 [.006] <input type="checkbox"/> <0,15 [.006] <input type="checkbox"/> Other:	
E	Total PTH TOL (Max-Min)	<input type="checkbox"/> >0,250 [.010] <input type="checkbox"/> 0,250 [.010] <input type="checkbox"/> 0,200 [.008] <input type="checkbox"/> 0,150 [.006] <input type="checkbox"/> 0,125 [.005] <input type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input checked="" type="checkbox"/> 0,050 [.002] <input type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	
F	Hole Location TOL DTP	<input type="checkbox"/> >0,50 [.020] <input type="checkbox"/> 0,50 [.020] <input type="checkbox"/> 0,40 [.016] <input type="checkbox"/> 0,30 [.012] <input type="checkbox"/> 0,25 [.010] <input type="checkbox"/> 0,20 [.008] <input type="checkbox"/> 0,15 [.006] <input type="checkbox"/> 0,10 [.004] <input checked="" type="checkbox"/> <0,10 [.004] <input type="checkbox"/> Other:	
G	Internal Layer Clearance (Min)	<input type="checkbox"/> >0,350 [.014] <input type="checkbox"/> 0,350 [.014] <input type="checkbox"/> 0,250 [.010] <input type="checkbox"/> 0,200 [.008] <input type="checkbox"/> 0,150 [.005] <input type="checkbox"/> 0,125 [.005] <input type="checkbox"/> 0,100 [.004] <input checked="" type="checkbox"/> 0,075 [.003] <input type="checkbox"/> <0,075 [.003] <input type="checkbox"/> Other:	

<p>H</p>	<p>Internal Layer Conductor Width (Min)</p>	<p><input type="checkbox"/> &gt;0,250 [.010]  <input type="checkbox"/> 0,250 [.010]  <input type="checkbox"/> 0,200 [.008]  <input type="checkbox"/> 0,150 [.006]  <input type="checkbox"/> 0,125 [.005]  <input checked="" type="checkbox"/> 0,100 [.004]  <input type="checkbox"/> 0,075 [.003]  <input type="checkbox"/> 0,050 [.002]  <input type="checkbox"/> &lt;0,050 [.002]  <input type="checkbox"/> Other:</p>	
<p>J</p>	<p>Internal Layer Process Allowance</p>	<p><input type="checkbox"/> &gt;0,100 [.004]  <input type="checkbox"/> 0,100 [.004]  <input type="checkbox"/> 0,075 [.003]  <input type="checkbox"/> 0,050 [.002]  <input type="checkbox"/> 0,040 [.0015]  <input type="checkbox"/> 0,030 [.0012]  <input checked="" type="checkbox"/> 0,025 [.001]  <input type="checkbox"/> 0,020 [.0008]  <input type="checkbox"/> &lt;0,020 [.0008]  <input type="checkbox"/> Other:</p>	
<p>K</p>	<p>External Layer Clearance (Min)</p>	<p><input type="checkbox"/> &gt;0,350 [.014]  <input type="checkbox"/> 0,350 [.014]  <input type="checkbox"/> 0,250 [.010]  <input type="checkbox"/> 0,200 [.008]  <input type="checkbox"/> 0,150 [.006]  <input type="checkbox"/> 0,125 [.005]  <input checked="" type="checkbox"/> 0,100 [.004]  <input type="checkbox"/> 0,075 [.003]  <input type="checkbox"/> &lt;0,075 [.003]  <input type="checkbox"/> Other:</p>	

L	External Layer Conductor Width (Min)	<input type="checkbox"/> >0,250 [.010] <input type="checkbox"/> 0,250 [.010] <input type="checkbox"/> 0,200 [.008] <input type="checkbox"/> 0,150 [.006] <input type="checkbox"/> 0,125 [.005] <input checked="" type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	
M	External Layer Process Allowance	<input type="checkbox"/> >0,100 [.004] <input type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> 0,040 [.0015] <input type="checkbox"/> 0,030 [.0012] <input checked="" type="checkbox"/> 0,025 [.001] <input type="checkbox"/> 0,020 [ [.0008] <input type="checkbox"/> <0,020 [.0008] <input type="checkbox"/> Other:	
N	Feature Location DTP	<input type="checkbox"/> >0,50 [.020] <input type="checkbox"/> 0,50 [.020] <input type="checkbox"/> 0,40 [.016] <input type="checkbox"/> 0,30 [.012] <input type="checkbox"/> 0,25 [.010] <input type="checkbox"/> 0,20 [.008] <input type="checkbox"/> 0,15 [.006] <input type="checkbox"/> 0,10 [.004] <input checked="" type="checkbox"/> <0,10 [.004] <input type="checkbox"/> Other:	

All Dimensions are in millimeters [inches shown in brackets]

# SECTION 2.5

## QUALITY DEVELOPMENT

DATE COMPLETED
----------------

This section is intended to provide overview information on the quality systems in place in the manufacturing facility.

### Site Capability Snapshot (Please Check all that apply.)

Designators			Remarks
A	Strategic Plan	<input type="checkbox"/> Functional Steering Committee Formed <input checked="" type="checkbox"/> TQM Plan & Philosophy Established & Published <input checked="" type="checkbox"/> Documented Quality Progress Review <input type="checkbox"/> Implementation & review of Project Team Recommendations <input checked="" type="checkbox"/> TQM Communicated throughout organization <input checked="" type="checkbox"/> Controlled New process Start-up <input checked="" type="checkbox"/> Management Participates in TQM Audits <input type="checkbox"/> Employee Recognition Program <input type="checkbox"/> Total TQM Plan/Involvement Customer Training <input type="checkbox"/> Other:	
B	Employee Involvement	<input type="checkbox"/> Certified Training Available <input checked="" type="checkbox"/> Training of Employee Base <input checked="" type="checkbox"/> TQM Team Trained <input type="checkbox"/> Design of Experiment Training and Use <input checked="" type="checkbox"/> New Process Implementation Training <input checked="" type="checkbox"/> Support Personnel Training <input type="checkbox"/> Advanced Statistical Training <input type="checkbox"/> Quality Functional Deployment <input checked="" type="checkbox"/> Ongoing Improvement Program for Employees <input type="checkbox"/> Other:	
C	Quality Manual	<input type="checkbox"/> Quality Manual Started <input type="checkbox"/> Generic Quality Manual for Facility <input type="checkbox"/> 10% of manufacturing depts. have process specifications <input type="checkbox"/> 25% of manufacturing depts. have process specifications <input type="checkbox"/> 50% of manufacturing depts. have process specifications <input type="checkbox"/> Non-manufacturing Manuals Developed <input type="checkbox"/> 25% of all departments have quality manuals <input type="checkbox"/> 50% of all departments have quality manuals <input checked="" type="checkbox"/> All Manufacturing and support depts. have controlled quality manual <input type="checkbox"/> Other:	

D	Instructions	<input type="checkbox"/> Work Instructions Started <input type="checkbox"/> Quality Instructions Started <input type="checkbox"/> 10% Work Instructions Completed <input type="checkbox"/> 10% Quality Instructions Completed <input type="checkbox"/> 25% Work Instructions Completed, Controlled <input type="checkbox"/> 25% Quality Instructions Completed, Controlled <input type="checkbox"/> 50% Work Instructions Completed, Controlled <input type="checkbox"/> 50% Quality Instructions Completed, Controlled <input checked="" type="checkbox"/> Quality and work Instruct. Completed, Controlled <input type="checkbox"/> Other:	
E	SPC Implementation IPC-PC-90	<input type="checkbox"/> Plan Exists <input type="checkbox"/> Training Started <input type="checkbox"/> Process Data Collected & Analyzed <input type="checkbox"/> All Employees Trained <input checked="" type="checkbox"/> First Process Stable & Capable <input type="checkbox"/> Several Major Processes Stable & Capable <input type="checkbox"/> Continued Improvement of Stable Processes <input type="checkbox"/> Additional Mfg Processes under Control <input type="checkbox"/> All Processes Under Control <input checked="" type="checkbox"/> Other: quarterly analysis program	
F	Supplier Programs/Controls	<input checked="" type="checkbox"/> Supplier Rating Program <input type="checkbox"/> Monthly Analysis Program <input checked="" type="checkbox"/> Key Problems Identified <input checked="" type="checkbox"/> Supplier Reviews Performance Data provided <input checked="" type="checkbox"/> TQM Acceptance by suppliers <input type="checkbox"/> 10% of Suppliers Using SPC <input type="checkbox"/> 25% of Suppliers Using SPC <input type="checkbox"/> 50% of Suppliers Using SPC <input type="checkbox"/> All Key Suppliers using Certified parts program <input type="checkbox"/> Other:	
G	Third Party IPC-QS-95	<input checked="" type="checkbox"/> Instrument Controls in Place <input type="checkbox"/> Measurement System in Control IPC-PC-90 <input checked="" type="checkbox"/> Document Controls in Place <input type="checkbox"/> Reduced Lot Sampling <input type="checkbox"/> 10% of Processes Under Audit Control <input type="checkbox"/> 50% or Greater of Processes Under Audit Control <input type="checkbox"/> ISO-9003 Certified <input type="checkbox"/> ISO-9002 Certified <input type="checkbox"/> ISO-9001 <input checked="" type="checkbox"/> Other: ISO-9001:2000 certified	

# SECTION 3

## EQUIPMENT PROFILE (Pre-Site Audit)

DATE COMPLETED  
12-10-07

\* Examples of equipment limitations include:  
min/max board size & min/max working area

3.1 PHOTOTOOL CAPABILITY	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) AOI of phototool	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Camtek 2V50	2	
B) AOI CAD reference (CAM)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Innoveda (FAB Factory and CAM 350 V9.5)	3	
C) Photoplotting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Gerber Scientific Cresnet 30 Laser Photoplotter	1	
D) Photo reductions	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E) Film scan and conversion	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
F) Film processing <input type="checkbox"/> air-dried <input type="checkbox"/> force-dried <input checked="" type="checkbox"/> processed in automatic processor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Agfa Raliline 66-3HT silver film developer with auto replenisher	1	
G) Media types <input checked="" type="checkbox"/> silver halide film <input type="checkbox"/> glass <input checked="" type="checkbox"/> diazo	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.2 DRILLING EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Manual	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Optical (single spindle)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) N.C. drill	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pluritec XLV-3 (3); V3 (5) Excellon System 2000 (1)	9	

3.3 ROUTING EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Edge beveler	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B) Hand router (pin router)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) N.C. router	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
D) N.C. driller/router	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pluritec Maxima 5 head drill/router Excellon EX-200 driller/router	2	
E) Scoring (profile)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Filotec SM-30 NC with 90 degree turn and jump scoring	1	
F) Scoring (straight line)	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.4 MECHANICAL EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Punch press	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Shear	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
C) Milling machine	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.5 HOLE PREPARATION (DESMEAR)	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Permagnate	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B) Plasma	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Outside service		
C) Mechanical	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Etchback	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plasma – outside service		

3.6 PRIMARY IMAGE APPLICATION	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Dry film	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B) Hand screening	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Machine screening	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Wet film	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E) Liquid photoimageable	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.7 TYPE OF TREATMENT FOR MULTILAYER INNERLAYERS	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Black oxide	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B) Red oxide	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
C) Copper scrub	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Durabond	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E) Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.8 LAMINATION	YES	NO	MATERIAL	QTY	APPLICATION TECHNIQUE
A) High pressure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TMP 175 TON 6 OPENING VACUUM PRESS Wabash 125 ton 3 opening PRESS	1 1	
B) High temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
C) Vacuum	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
D) Vacuum assist	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
E) Foil heat assist	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
F) Separate cool-down	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.9 ELECTROLESS COPPER PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Fully additive application	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Electroless deposition (semiadditive)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TNT 27 tank auto electroless line	1	
C) Through-hole and via	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Baker Brothers 30 tank auto electroless line	1	

3.10 COPPER ELECTROPLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Copper sulfate	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B) Pyrophosphate	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Copper fluoborate	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.11 TIN/LEAD SURFACE PLATINGS/COATINGS	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Tin/lead electroplated	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Immersion tin or tin/lead (electroless)	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
C) Hot air solder leveled (HASL)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ARGUS 5124 Hot Air Solder level AVALON AVTEC-406 HASL	2	63/37 Tin/Lead solder Lead Free Solder

3.12 FUSING PROCESSES	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) I.R. reflow	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Hot oil reflow	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Horizontal (hot air level)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Vertical (hot air level)	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.13 NICKEL SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Electroless nickel	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B) Electroplated nickel	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.14 GOLD SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Electroless gold	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Electroplated gold	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.15 PALLADIUM SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Electroless palladium (immersion)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Electroplated palladium	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.16 SOLDERMASK	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Screened deposited image	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Dry film photoimageable	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Liquid photoimageable	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
D) Dry film/liquid combination	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.17 ORGANIC SURFACE PROTECTION	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Benzotriazole	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Imidazole	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
C) Benzimidazole	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.18 MICROSECTION CAPABILITY	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B) Single cavity automated	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Multiple cavity automated	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
D) Plating thickness analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.19 CHEMICAL ANALYSIS	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Etching chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dalux Alkaline Etcher	1	
B) Plating chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
C) Effluent (PPM) analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Consistently passes Local sewage treatment requirements		

3.20 ELECTRICAL TEST EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Continuity and shorts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ATG 1200 bare board ATG 1000 bare board	2	
B) Fixture development	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
C) Flying probe test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Probot 880 ATG 3X	2	
D) Impedance control	X	<input type="checkbox"/>	Manual TDR	1	



# SECTION 4

## TECHNOLOGY PROFILE SPECIFICS

DATE COMPLETED 12-10-07
----------------------------

### 4.1 ADMINISTRATION

4.1.1 CAPACITY PROFILE	EST %	COMMENTS
A) Total annual capacity in square meters (surface area) per month		10,000 square meters/month
B) Presently running at ____ % of capacity	50	

4.1.2 PERCENTAGE OF DOLLAR VOLUME	EST %	COMMENTS
A) Single sided (rigid)	5	
B) Double sided (rigid)	55	
C) Multilayer (rigid)	40	
D) Single side (unreinforced-flex)	N/A	
E) Double sided (unreinforced-flex)	N/A	
F) Multilayer (unreinforced-flex)	N/A	
G) Multilayer (rigid/flex)	N/A	

4.1.3 PANEL PRODUCTION PROFILE	UNITS PER MONTH
A) Size of a production lot in panels	
1) Normal	60
2) Smallest	2
B) Number of panels per month	
1) High Production	0
2) Medium Production	1,800
3) Low Production	400
3) Short run	400
4) Prototype	400

C) Average lead time (delivery) as defined in B)			
1) High Production	0		
2) Medium Production	3 weeks		
3) Low Production	3 weeks		
3) Short run	1 week		
4) Prototype	3 days		
Quick turn - No. of days <u>1</u> .			
D) Product delivered in full panel or array sub-panel format			
1) Total in panel or array format	45 % of total production		
2) Scored format	25% of total production		
3) Tab breakaway format	20 % of total production		
4) Other	0		
5) Total to customer layout	35%		
6) Total to manufacturing layout	10%		
E) Product delivered in board format			
1) Total in board format	55% of total production		
2) Extracted: scored to size	22% of total production		
3) Extracted: sheared to size	0		
4) Extracted: routed to size	33% of total production		
<b>4.1.4 APPROVAL AND CERTIFICATION</b>	<b>YES</b>	<b>NO</b>	<b>COMMENTS</b>
A) Company approvals			
1) UL approval	<input checked="" type="checkbox"/>	<input type="checkbox"/>	94V Level 0 130 degrees C max. operating Temperature
2) Canadian standards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3) MIL-P-55110	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Working towards approval for MIL-PRF-31032A
4) MIL-P-50884	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5) ISO-9002	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6) ISO-9001	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ISO-9001-2000 approved by BSI; Certificate No: FM 53681

	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7) ISO-14000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8) BABT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9) EEC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
10) Customer satisfaction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>B) Other certification information</b>			
1)Laminate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2)Quality standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3)Equipment calibration	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

<b>4.1.5 CUSTOMER INTERFACE PROFILE</b>	<b>YES</b>	<b>NO</b>	<b>COMMENTS</b>
A) Modem capability	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B) Baud rate	<input type="checkbox"/>	<input type="checkbox"/>	
C) Data verification technique	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D) Engineering change order process	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E) Job status reporting to customers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

<b>4.1.6 OTHER CAPABILITIES</b>	<b>YES</b>	<b>NO</b>	<b>COMMENTS</b>
A) Facility research and development	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
B) (Automated) On-line shop floor control/MRP system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
C) Process control system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D) Operator training system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**4.2 PROCESS ORIENTATION**

4.2.1 LAMINATE MATERIAL	EST %	COMMENTS
A) Most commonly used laminates (G10, FR4, etc.)	FR4 FR4 FR4 FR4	Brand name ISOLA for multilayers: 370HR, Tg of 180 C Brand name NANYA Type Brand name SHANGHAI NANYA Type Brand name KING BOARD Type
B) Other laminate material	CERA MIC	ROGERS 4000 SERIES
1) Planar resistor layers	No	UL approved <input type="checkbox"/>
2) BT epoxy	No	UL approved <input type="checkbox"/>
3) Kevlar	No	UL approved <input type="checkbox"/>
4) Teflon	Yes	UL approved <input type="checkbox"/>
5) Polyimide	Yes	UL approved <input type="checkbox"/>
6) Cyanate ester	No	UL approved <input type="checkbox"/>
7) Other		UL approved <input type="checkbox"/>
C) Specification to which laminate is purchased (check all that apply) <input type="checkbox"/> MIL-P-13949 <input type="checkbox"/> IPC-4204 <input checked="" type="checkbox"/> IPC-4101 <input checked="" type="checkbox"/> UL Approved <input type="checkbox"/> IPC-4103 <input type="checkbox"/> Other <input type="checkbox"/> IPC-4202 <input type="checkbox"/> IPC-4203		
D) Laminate storage <input type="checkbox"/> Uncontrolled <input checked="" type="checkbox"/> Humidity controlled <input checked="" type="checkbox"/> Temperature controlled <input type="checkbox"/> Dry box <input type="checkbox"/> JIT inventory		
E) Panel size configurations in X, Y dimensions maximum X <u>508</u> Y <u>660</u> mm minimum X <u>305</u> Y <u>457</u> mm other X <u>457</u> Y <u>610</u> mm		

4.2.2 PROCESS PRECISION SPECIFICS	YES	NO	VALUE	COMMENTS
A) Maximum printed board thickness built in volume	yes		0.125"	
1) Single sided	yes			
2) Double sided	yes			
3) Multilayer	yes			
4) Rigid flex				
B) Printed board electrical performance capability				
1) Impedance control	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
2) Capacitance control	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
3) Microstrip boards	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
C) Tooling system description				
1) Same holes in panels used for all processes	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
2) Optical registration	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Process:
3) Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

4.2.3 OTHER PROCESS ORIENTATION SPECIFICS	YES	NO	SYSTEM	COMMENTS
A) Solder mask over bare copper	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
B) Plating/coating information				
1) Tin/lead reflow	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
2) Hot air leveling	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3) Azole organic	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4) Conductive	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
C) Hole formation				
1) Hole cleaning	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
2) Hole cleanliness verified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Small holes less than 0.021"	

### 4.3 PRODUCT DESCRIPTION

\*CONSISTENCY IMPLIES YIELDS IN EXCESS OF 80%

4.3.1. THROUGH HOLE INSERTION	EST %	SIZE (MM) - +/- TOL	COMMENTS
A) Smallest conductor width and tolerance produced with consistency			
1) Outer layers (print and etch)		Size <u>0.105 mm</u> Tol $\pm$ <u>0.0105 mm</u>	
2) Inner layers (print and etch)		Size <u>0.105 mm</u> Tol $\pm$ <u>0.0105 mm</u>	
3) Outer layers (plated)		Size <u>0.105 mm</u> Tol $\pm$ <u>0.0105 mm</u>	
4) Inner layers (plated)		Size <u>0.105 mm</u> Tol $\pm$ <u>0.0105 mm</u>	
5) Outer layers (additive plating)		Size _____ mm Tol $\pm$ _____ .mm	
6) Inner layers (additive plating)		Size _____ mm Tol $\pm$ _____ .mm	
B) Smallest plated-through hole (PTH) and tolerance consistently produced in 1.5mm thickness material or multilayer board		0.205 mm +/- 0.010 mm	
1) Minimum PTH diameter		Size <u>0.205 +/- 0.010mm</u> Tol $\pm$ <u>0.010 mm</u>	
2) Largest panel where this hole can be controlled (across diagonal)		Size <u>612 mm</u> Tol $\pm$ <u>0.105 .mm</u>	
C) Largest hole size that can be drilled and plated through in a 1.25mm diameter land while maintaining an annular ring of 0.125mm in large/small boards		0.94mm	
1) Largest board size (across diagonal)		Size <u>797 mm</u>	
2) Largest hole diameter		Size <u>0.94 mm</u>	
3) Smallest board size (across diagonal)		Size <u>514 mm</u>	
4) Largest hole diameter		Size <u>0.94 mm</u>	
D) Surface mount land pattern pitch (check all that apply)			
<input type="checkbox"/> 1.27mm [.050] <input type="checkbox"/> 0.63mm [.025]			
<input checked="" type="checkbox"/> 0.5mm [.020] <input type="checkbox"/> 0.4mm [.016]			
<input checked="" type="checkbox"/> 0.3mm [.012] <input type="checkbox"/> 0.25mm [.010]			
<input type="checkbox"/> Other _____ .			

E) Solder mask dam between lands (check all that apply) <input checked="" type="checkbox"/> 1.27mm [.050] <input checked="" type="checkbox"/> 0.63mm [.025] <input checked="" type="checkbox"/> 0.5mm [.020] <input checked="" type="checkbox"/> 0.4mm [.016] <input checked="" type="checkbox"/> 0.3mm [.012] <input checked="" type="checkbox"/> 0.25mm [.010] <input checked="" type="checkbox"/> Other <u>0.0762mm</u> .			
F) Flatness tolerance (bow & twist) after reflow or solder coating <input type="checkbox"/> 1.5% <input checked="" type="checkbox"/> 1.0% <input type="checkbox"/> 0.5% <input type="checkbox"/> Other ____			

4.3.2 PRODUCT QUALITATIVE AND QUANTITATIVE INFORMATION	YES	NO	QUANTITY OF PANELS	NUMBER of DIMENSION	COMMENTS
A) Multilayer layer count	yes				18 layers
1) Maximum layers fabricated in volume (Maximum Lot)	yes		60	18X24"	
2) Maximum layers fabricated in prototype (Minimum Lot)			3	18X24"	
B) Buried vias produced consistently in volume	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1) Size	Yes				0.008"
2) Number of layers	yes		25		8 layers
B) Blind vias produced consistently in volume	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1) Size	Yes				0.008"
2) Number of layers					8 layers
1) Controlled depth drilling	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
2) Total number of layers					

**4.4. TESTING CAPABILITY**

4.4.1 TEST AND TEST EQUIPMENT CAPABILITY	YES	NO	COMMENTS
A) SMT centerline pitch that can be electrically tested <input type="checkbox"/> 0.63mm [.025] <input type="checkbox"/> 0.5mm [.020] <input type="checkbox"/> 0.4mm [.016] <input checked="" type="checkbox"/> 0.3mm [.012] <input type="checkbox"/> 0.25mm [.010] <input checked="" type="checkbox"/> Other	YES		0.007"
B) Double sided simultaneous electrical testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1) Equipment type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FLYING PROBE
2) X-ray fluorescence inspection equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VEECO XRF-530L
3) TDR equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4) Hi-pot test equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5) Four-wire kelvin tester	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

6) Capacitance meter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7) Cleanliness testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

4.4.2 AUTOMATED OPTICAL INSPECTION USAGE	EST %	COMMENTS
A) Before etching	no	
B) After etching	yes	
C) Internal layers	yes	
D) Final inspection	no	
E) Other	yes	Multilayers before solder mask
F) Conductor/clearance normally inspected by AOI equipment	yes	multilayers
1) <input type="checkbox"/> 0.05mm [.002]	no	
2) <input type="checkbox"/> 0.05-.10mm [.002-.004]	yes	
3) <input type="checkbox"/> >.10mm [.004]		
4) <input type="checkbox"/> Planes	yes	
G) CAD download to AOI	yes	

# SECTION 5

## QUALITY PROFILE

DATE COMPLETED
----------------

### GENERAL INFORMATION

COMPANY NAME	
CONTACT	
TELEPHONE NUMBER	FAX NUMBER

This section of the Manufacturer's Qualification Profile is intended to describe the Total Quality Management (TQM) activity in place of being implemented at the manufacturing facility identified in the site description of this MQP.

To ease in the task of identifying the TQM program being planned or underway at the manufacturing site, the activities have been divided into twenty sections which when completed, provide the total picture of the posture toward managing quality issues. Each section contains a number of questions with regard to the topic under review.

It is not the intent to have the questions be all encompassing, nor is every question applicable to all manufacturers. However, identification of the status, related to each questions, when considered as a whole will convey an impression of the progress that the company has achieved in adopting the principles of total quality management.

The twenty sections, in order of the occurrence are:

- |                                       |  |
|---------------------------------------|--|
| 5.1 General Quality Programs          | 5.11 Statistical Process Control             |
| 5.2 New Products/Technical Services   | 5.12 Problem Solving                         |
| 5.3 Customer Satisfaction             | 5.13 In-Process Control                      |
| 5.4 Computer Integrated Manufacturing | 5.14 Receiving Inspection                    |
| 5.5 Process Documentation             | 5.15 Material Handling                       |
| 5.6 Quality Records                   | 5.16 Non-Conforming Material Control         |
| 5.7 Skill, Training & Certification   | 5.17 Inspection and Test Plan                |
| 5.8 Subcontractor Control             | 5.18 Product Inspection/Final Audit          |
| 5.9 Calibration Control               | 5.19 Tooling Inspection, Handling, & Storage |
| 5.10 Internal Audits                  | 5.20 Corrective Action                       |

Each section provides a status report related to each question. The question may not be applicable, no activity has started as yet, or the company may have developed an approach to the issues raised by the questions. An (X) is indicated in the appropriate column. If deployment/implementation has started, the status is reported as percent deployment; this is indicated in column 4. The percentage number closely approximates the status of deployment. If deployment exists, the percentage results that have been achieved is indicated in column 5. Results are based on expected goals. Not providing percent information in either the deployment or results column implies a lack of activity in the particular area.

The quality descriptions requested are completed on the following pages by checking (X) the appropriate column to reflect the status of the manufacturing facility TQM program. Additional information may be provided as comments shown below, or on individual sections, or additional sheets as necessary.

COMMENTS

5.1 GENERAL QUALITY PROGRAMS		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are quality objectives and responsibilities clearly stated, widely distributed and understood through the company?					100
2.	Is there a quality function or well defined organization which provides customer advocate guidance to the total organization and is this position fully supported by management?					100
3.	Does a quality measurement system exist with clearly defined metrics and is it utilized as a management tool?					100
4.	Are work instructions approved and controlled; and are they under revision control?					100
5.	Are the quality procedures and policies current and available at the point of application; and are they under revision control?					100
6.	Are benchmark and customer satisfaction studies done to determine best in class for all products, services, and administrative functions; and are quality goals set?					100
7.	Are Statistical Process Control (SPC) principles understood by all levels of management?			X	5	5
8.	Are there programs with sufficient resources assigned to support corrective actions and prevention?					100
9.	Does management solicit and accept feedback from the work force?					100
10.	Is there management support of ongoing training (including quality training), and is it documented by an organizational training plan?					100
11.	Are there regular management reviews of elements of the quality improvement process, including feedback for corrective action, and are the results acted upon?					100
12.	Are the quality and reliability goals aggressive relative to customer expectations and targeted at continuous improvement?					100
13.	Are the people who are responsible for administering the quality assurance function technically informed?					100
14.	Does Management have a "defect prevention" attitude to achieve continuous improvement?					100

5.2 NEW PRODUCTS/TECHNICAL SERVICES		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Do new product/technology/service development policies and procedures exist, and do they result in clearly defined project plans with appropriate measureables and approvals?					100
2.	Is quantitative benchmarking used to evaluate all new products/technologies/services in comparison to best-in-class offerings?					100
3.	Does a roadmap exist to ensure continued development of leading edge, best-in-class products/technology/services?					100
4.	Is the capability of each operation which controls critical-to-function characteristics for new products, fully certified?					100
5.	Are statistical tools used in the development of robust (high yield) new processes, products, and services?		X			
6.	When new product/technology/service requires a new process, is it developed jointly and concurrently with the customer and/or suppliers?					100
7.	Are design reviews conducted on a scheduled basis which properly address the process capability indices of critical-to-function and product/service characteristics?					100
8.	Is the new product/technology/service, as produced by the process, verified to meet all customer satisfaction requirements?					100

COMMENTS

5.3 CUSTOMER SATISFACTION		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Is there a measurement system in place to assess the customer's perception of complete performance?					100
2.	Is an independent (unbiased) customer survey routinely conducted?					100
3.	Is there an internal measurement system within the organization which correlates to the level of customer satisfaction?					100
4.	Are there specific goals for achieving Total Customer Satisfaction, both internal and external?					100
5.	To what extent are customer satisfaction goals disseminated and understood by everyone in the organization?					100
6.	Does management regularly review and assess all operating systems to determine if barriers to customer satisfaction exist and are appropriate action plans then implemented?					100
7.	Is there a method in place to obtain future customer requirements?		X			
8.	Are all findings of customer dissatisfaction reported back to the proper organization for analysis and corrective action?					100
9.	Are customer satisfaction requirements formally defined and documented, and are they based on customer input?					100
10.	Do all support organizations understand their role in achieving total customer satisfaction?					100

5.4 COMPUTER INTEGRATED MANUFACTURING		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are systems integrated to allow electronic transfer of information between multiple systems to eliminate redundant data entry?					100
2.	Can customers electronically transfer CAD/CAM directly into manufacturing?					100
3.	Can customers electronically transfer order information directly into the business system?					100
4.	Is data electronically shared between shop floor control and process control systems (i.e., CNC, SPC, Electrical Test, AOI, etc.)?					100
5.	Are planning systems (MRP, forecasting, capacity planning, financial planning, etc.) electronically integrated with operation systems (order processing, purchasing, inventory management, shop floor control, financial/cost control, etc.)?					100
6.	Is information available from system processes in real time (vs. batch processing)?					100
7.	Are processes and procedures documented and available on-line?					100
8.	Do all functional departments have system access to key financial, manufacturing, sales, and operational data, as it relates to their functional objectives?					100
9.	Are computer simulation and design tools used to the maximum extent practicable in the design of new products/technologies/services					100

COMMENTS						

5.5 PROCESS DOCUMENTATION		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are manufacturing product, process, and configuration documents under issue control?					100
2.	Are "preliminary" and "special product" specifications controlled?					100
3.	Does the system ensure that the most current customer specifications are available to the manufacturing personnel?					100
4.	Does the system ensure that the most current material specifications are available to the procurement function?					100
5.	Are incoming orders reviewed for revisions and issue changes?					100
6.	Is conformance to customer specifications assured before an order is accepted?					100
7.	Is customer feedback provided when designs do not meet manufacturability requirements?					100
8.	Are critical characteristics classified, relative to impact on product performance?					100
9.	Are customers informed of changes made to products controlled by customer drawings or specifications?					100
10.	Is there an effective internal deviation control procedure and, are customer requested deviations documented and followed?					100
11.	Do new product development procedures exist, and are they followed in the design development process?					100

5.6 QUALITY RECORDS		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are records of inspection and process control maintained and available for review?					100
2.	Are records of equipment and equipment maintenance kept?					100
3.	Is the record and sample retention program defined?					100
4.	Are quality data used as a basis for corrective action?					100
5.	Are quality data used in reporting performance and trends to management?					100
6.	Are quality data used in supporting certifications of quality furnished to customers?					100
7.	Is field information used for corrective action?					100
8.	Does a cost of quality measurement system exist?					100
9.	Are customer reported quality problems responded to, and resolved in the time period requested?					100
10.	Is quality information on production material rejects provided to sub-suppliers with required corrective action?					100
11.	Are computers used to collect and analyze quality data?					100

## COMMENT

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5.7 SKILLS, TRAINING, & CERTIFICATION		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Does management ensure that all personnel are trained in their role for achieving Total Customer Satisfaction?					100
2.	Do all personnel understand how their performance impacts internal and external customer satisfaction?					100
3.	Do all personnel who contact external customers reflect quality improvement programs?					100
4.	Do personnel participate in professional societies and growth programs?		X			
5.	Are all personnel trained in sufficient detail to support key initiatives?					100
6.	Are the results of training evaluated and indicated program changes made?					100
7.	Does a policy exist which encourages the cross training and rotation of personnel, and is this policy used as the basis of job progression?					100
8.	Are performance standards participatively developed, and regularly applied for all personnel?					100
9.	Are Total Customer Satisfaction programs and resulting successes publicized to all personnel?					100
10.	Do goal setting and reward/incentive programs support the quality improvement process?					100

5.8 SUBCONTRACTOR CONTROL		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are requirements defined, communicated, and updated to ensure that the supplier understands expectations?					100
2.	Does a system exist which measures the performance of the supplier and communicates such information to the supplier? (i.e., supplier rating system)					100
3.	Have the organization's processes been characterized to identify the critical requirements for the suppliers products?					100
4.	Have the capabilities of the supplier's processes been assessed and considered in the establishment of the requirements?					100
5.	Have partnerships been established with suppliers, and is assistance provided to ensure that each supplier has the capability to consistently supply conforming products?					100
6.	Have quality and cycle time metrics and improvement goals been established participatively with the supplier?		X			
7.	Has a system been established with the supplier for identification and verification of corrective action?					100
8.	Have the requirements for supplier materials been properly characterized and specified to ensure conformance of the product/service to the customer satisfaction requirements?					100
9.	Is there a supplier certification program or equivalent procured material/service continuous quality improvement program?					100
10.	Can all personnel who contract suppliers properly reflect appropriate quality improvement programs and status to them?					100

COMMENT	

5.9 CALIBRATION CONTROL		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are calibration and preventative maintenance programs in place and documented?					100
2.	Are calibration and maintenance personnel trained?					100
3.	Is traceability to NIST maintained?					100
4.	Is quality measurement and control equipment current, effective, and sufficiently integrated with production equipment?					100
5.	Is the history of quality measurement and control equipment documented?					100
6.	Has repeatability of measuring devices and inspection or testing processes been established and monitored; are gauge capability studies conducted and GR&R ratios acceptable(<10%)?					100
7.	Are calibration and preventative maintenance cycles on schedule?					100
8.	Is the use of non-calibrated equipment for design and production purposes prohibited?					100
9.	Are tools and fixtures used as criteria or acceptability of product/work fully qualified and identified?					100
10.	Are calibration intervals defined in accordance with industry standards or manufacturer's recommendations and the calibration history of the equipment?					100

5.10 INTERNAL AUDITS		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are regular reviews of the product/process conducted and are goals/plans established to continually improve?					100
2.	Are the processes/products properly documented and controlled? Do they include appropriate customer requirements and are they executed in conformance to the documentation?					100
3.	Are the required quality checks built into the operations within the manufacturing, field installation, and service process, and is the resulting data maintained and promptly acted upon?					100
4.	Are all pertinent methods of statistical quality control properly, effectively and efficiently used?			X	20	20
5.	Does a process change control system exist, and are customers informed of changes made to products and processes with customer approval prior to the change, when required?					100
6.	Are the operators within the process provided with written work instructions and are they trained?					100
7.	Is the receipt, handling, storage, packaging and release of all material, including customer provided items, at all stages, specified and controlled to prevent damage or deterioration, and to address obsolete material?					100
8.	Is there a first in/first out (FIFO) system in place, and is it followed?					100

COMMENTS

5.11 STATISTICAL PROCESS CONTROL		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Have the personnel who will be responsible for guiding the implementation of SPC been designated?					100
2.	Are statistical techniques used to reduce variation in the engineering process before the start of production?			X		20
3.	Is the quality system dependent upon process rather than product controls?	PRO	CESS	CON	TRO	LS
4.	Is the capability of critical processes and machines measured and monitored with CPK's >1.5, and targeted with CP of 2.0?				X	20
5.	Are incapable processes or machines targeted for improvement or replacement?				X	50
6.	Is SPC implemented for all critical processes?				X	20
7.	Are procedures that control the reaction to out-of-control situations adequate and effective?			YES		
8.	Are operators trained in the use of appropriate statistical techniques, and are they properly applying them?				X	20
9.	Are advanced problem solving techniques used by engineers to solve problems? (Design of Experiments, planned experimentation, advanced diagnostic tools, etc.)					100
10.	Are control charts and other process controls properly implemented?				X	50
11.	Is statistical process control being practiced in work centers and are yields being recorded and plotted on a scheduled basis, with respect to upper and lower control limits?				X	20

5.12 PROBLEM SOLVING		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are employees trained in problem solving techniques, in comparison to the needs of the organization?					100
2.	Does the organization utilize participative problem solving techniques to identify, measure and resolve internal and external problems?					100
3.	Are problem solving efforts timely and effective?					100
4.	Are applied resources sufficient to remove problem solving constraints?					100
5.	Are statistical techniques used for problem solving?			X		20
6.	Are quality data used to identify barriers, and to determine the priority of problems?					100
7.	Is there a policy/procedure that includes the use of problem solving techniques to systematically drive reduction in variability?			X		50

COMMENTS						

5.13 IN-PROCESS CONTROL		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are process capabilities established and maintained on all major processes? (critical parameters)					100
2.	Are in-process inspections, test operations, and processes properly specified and performed?					100
3.	Are in-process inspection facilities and equipment adequate?					100
4.	Are the results of in-process inspections used in the promotion of effective preventative action and corrective action?					100
5.	Is preventative maintenance performed on the equipment and facilities?					100
6.	Are housekeeping procedures adequate and how well are they followed?					100
7.	Are process management plans established, and are critical parameters followed?					100
8.	Are work areas uncluttered and free of excess work-in-process, supplies, debris, etc? Is the environment conducive to producing quality work? Is proprietary information adequately protected?					100
9.	Are certifications and in-process inspection results used in making final acceptance decisions?					100
10.	Are methods and procedures for the control of metallurgical, chemical, and other special processes established and followed?					100

5.14 RECEIVING INSPECTION		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are receiving inspection facilities and equipment adequately and properly maintained?					100
2.	Are receiving inspection procedures documented and followed?					100
3.	Are receiving inspection results used for corrective and preventive action?					100
4.	Are the procedures for storage and timely disposition of discrepant material in place and followed?					100

COMMENTS

5.15 MATERIAL HANDLING		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are procured material releases from receiving inspection clearly identified, as to acceptance status?					100
2.	Are procedures to facilitate limited life materials, such as prepreg, in place, properly controlled, and monitored?					100
3.	Are procured items identified with some means of traceability (serial number, lot number, date code, etc.)?					100
4.	Are procedures and facilities adequate for storage, release and control of materials?					100
5.	Are in-store and in-process materials properly identified and controlled?					100
6.	Is in-process material protected from corrosion, deterioration, and damage?					100

5.16 NON-CONFORMING MATERIAL CONTROL		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Is non-conforming material identified, segregated from regular production material, and properly dispositioned?					100
2.	Are non-conforming materials properly identified and controlled to prevent inadvertent use?					100
3.	Is the review and disposition of non-conforming materials defined, and are provisions made for inclusion of the customer in disposition decision?					100
4.	Are procedures for controlling non-conforming materials, and for ensuing corrective action, in place and followed?					100
5.	Do procedures provide for material review by a committee consisting of Quality and Engineering (as a minimum), to determine the disposition of non-conforming materials? (deviating from drawings or specification)					100
6.	Do supplier's procedures and controls for corrective action prevent recurrence of non-conformances?					100
7.	Is there a system for coordinating necessary corrective action with purchasing personnel?					100
8.	Does the corrective action extend to all applicable causes of non-conformance (e.g., design, workmanship, procedures, equipment, etc.)?					100

COMMENTS

5.17 INSPECTION AND TEST PLAN		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are statistical techniques used in determining the acceptability of finished goods to customer requirements?			X		20
2.	Are periodic tests conducted to audit reliability and environmental performance of the final product?					100
3.	Is CPK tracking performed for critical characteristics, with plans to achieve CPK = 1.5 with a target of CP of 2.0?			X		20
4.	Is root cause failure analysis performed for internal and external failures, and is appropriate corrective action implemented?					100
5.	Are test and inspection personnel trained in the procedures of their operations, and are those procedures being followed?					100
6.	Is the new product/technology/service, as produced by the processes, verified to meet all customer satisfaction requirements?					100

5.18 PRODUCT INSPECTION/FINAL AUDIT		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are final product acceptance procedures documented and followed?					100
2.	Are all specific customer product audits conducted, as required?					100
3.	Are inspectors trained for the tasks performed?					100
4.	Are flow charts or milestones developed with checkpoints readily available?					100
5.	Is a system in place which denotes inspection performed; e.g., use of initials, stamps, labels, bar codes, etc., affixed to production documentation?					100
6.	Is a quality system established and maintained for control of product/production documentation?					100
7.	Is "accept/reject" criteria defined and available for use?					100
8.	Is a final audit performed to ensure that all required verifications and tests, from receipt of materials through point of product completion, have been accomplished?					100
9.	Are packing and order checking procedures documented and followed?					100

COMMENTS						

5.19 TOOLING INSPECTION, HANDLING, & STORAGE		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are temperature, humidity, laminar flow controls in place to prevent contamination, and to assure dimensional stability?					100
2.	Do operators use hairnets, gloves & lab coats in all photolab and photoexposure areas?					100
3.	Are work instructions and related forms in place to control all applicable tooling requirements, as stated in the customer's purchase order?					100
4.	Are customer provided artworks controlled with regard to handling, storage, revision control and relationship to converted production phototools (working films)?					100
5.	Are production phototools (working films) controlled with regard to handling, storage, use life, and relationship to customer purchase order?					100
6.	Are customer provided artworks and production phototools (working films) inspected, including dimensional checks?					100
7.	Are all tools, fixtures, and other devices, used for tooling inspection and control, maintained under the calibration control procedure?					100
8.	Are records showing initial acceptance, periodic checks, and any needs for rework and/or modification available?					100

5.20 CORRECTIVE ACTION		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are final acceptance inspection results used for corrective and preventative action?					100
2.	Is root-cause analysis performed for non-conformances? This includes, but is not limited to, non-conformances (problems) caused by suppliers, found/caused "in-house" during processing, or those reported by the customer.					100
3.	Is positive action taken to prevent recurrence of problems, and are there documented reports/records of each occasion?					100
4.	Do procedures and systems provide for ensuring that replies are made to customer requests for correction action within the time limit specified?					100
5.	Is corrective action controlled and documented for all applicable work centers?					100
6.	When corrections are made, is their effectiveness subsequently reviewed and monitored?					100

COMMENTS

DATE COMPLETED 12-10-07
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# SECTION 6 (CHECK ONE IN EACH LINE THAT APPLIES)

## MANUFACTURING HISTORY (See Section 2 Site Capability)

Please complete as many history profiles so that the total descriptions of products you manufacture account for production orders that reflect 70% of your business. History profiles are for board or board family (board types may be grounded together if they are similar).

BOARD TYPE MULTILAYER	DATE OF ORDER 08-09-07	<b>Material: ISOLA 370HR</b>	HISTORY # 1
VIA TYPE Blind & buried	PRODUCTION QUANTITY 20 panels	TOTAL YEARLY PRODUCTION % 15	

Dimensions in millimeters (inches in brackets)

BOARD			HOLES		
BOARD SIZE DIAGONAL	TOTAL BOARD THICKNESS	NUMBER CONDUCTIVE LAYERS	DIA DRILLED HOLES	TOTAL PTH TOL (MAX-MIN)	LOCATION TOL DTP
<input type="checkbox"/> <250 [ $<10.00$ ]	<input type="checkbox"/> <1,0 [ $<.040$ ]	<input type="checkbox"/> 1-4 [1-4]	<input type="checkbox"/> >0,5 [ $>.020$ ]	<input type="checkbox"/> >0,250 [ $> .010$ ]	<input type="checkbox"/> >0,50 [ $>.020$ ]
<input type="checkbox"/> 250 [10.00]	<input type="checkbox"/> 1,0 [.040]	<input type="checkbox"/> 5-6 [5-6]	<input type="checkbox"/> 0,5 [.020]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,50 [.020]
<input type="checkbox"/> 350 [14.00]	<input checked="" type="checkbox"/> 1,6 [.060]	<input checked="" type="checkbox"/> 7-8 [7-8]	<input type="checkbox"/> 0,4 [.016]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,40 [.016]
<input type="checkbox"/> 450 [17.50]	<input type="checkbox"/> 2,0 [.080]	<input type="checkbox"/> 9-12 [9-12]	<input type="checkbox"/> 0,35 [.014]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,30 [.012]
<input type="checkbox"/> 550 [21.50]	<input type="checkbox"/> 2,5 [.100]	<input type="checkbox"/> 13-16 [13-16]	<input type="checkbox"/> 0,30 [.012]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,25 [.010]
<input type="checkbox"/> 650 [25.50]	<input type="checkbox"/> 3,5 [.135]	<input type="checkbox"/> 17-20 [17-20]	<input type="checkbox"/> 0,25 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,20 [.008]
<input type="checkbox"/> 750 [29.50]	<input type="checkbox"/> 5,0 [.200]	<input type="checkbox"/> 21-24 [21-24]	<input checked="" type="checkbox"/> 0,20 [.008]	<input checked="" type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,15 [.006]
<input type="checkbox"/> 850 [33.50]	<input type="checkbox"/> 6,5 [.250]	<input type="checkbox"/> 25-28 [25-28]	<input type="checkbox"/> 0,15 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,10 [.004]
<input type="checkbox"/> >850 [ $>33.50$ ]	<input type="checkbox"/> >6,5 [ $>.250$ ]	<input type="checkbox"/> >28 [ $>28$ ]	<input type="checkbox"/> <0,15 [.006]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input checked="" type="checkbox"/> <0,10 [ $<.004$ ]
<input checked="" type="checkbox"/> Other: 24"	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

### CONDUCTORS

INTERNAL ELEC CLEARANCE (MIN)	INTERNAL COND WIDTH (MIN)	INTERNAL PROCESS ALLOWANCE	EXTERNAL ELEC CLEARANCE (MIN)	EXTERNAL COND WIDTH (MIN)	EXTERNAL PROCESS ALLOWANCE	FEATURE LOCATION DTP
<input type="checkbox"/> >0,350 [ $>.014$ ]	<input type="checkbox"/> >0,250 [ $>.010$ ]	<input type="checkbox"/> >0,100 [ $>.004$ ]	<input type="checkbox"/> >0,350 [ $>.014$ ]	<input type="checkbox"/> >0,250 [ $>.010$ ]	<input type="checkbox"/> >0,100 [ $>.004$ ]	<input type="checkbox"/> >0,50 [ $>.020$ ]
<input type="checkbox"/> 0,350 [.014]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,350 [.014]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,50 [.020]
<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,40 [.016]
<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,30 [.012]
<input type="checkbox"/> 0,150 [.005]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,25 [.010]
<input type="checkbox"/> 0,125 [.005]	<input checked="" type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,030 [.0012]	<input type="checkbox"/> 0,125 [.005]	<input checked="" type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,030 [.0012]	<input type="checkbox"/> 0,20 [.008]
<input checked="" type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,025 [.001]	<input checked="" type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,025 [.001]	<input type="checkbox"/> 0,15 [.006]
<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,020 [.0008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,020 [.0008]	<input type="checkbox"/> 0,10 [.004]
<input type="checkbox"/> <0,075 [ $<.003$ ]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input checked="" type="checkbox"/> <0,020 [ $<.0008$ ]	<input type="checkbox"/> <0,075 [ $<.003$ ]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input checked="" type="checkbox"/> <0,020 [ $<.008$ ]	<input checked="" type="checkbox"/> <0,10 [ $<.004$ ]
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

# SECTION 6 (CHECK ONE IN EACH LINE THAT APPLIES)

## MANUFACTURING HISTORY (See Section 2 Site Capability)

DATE COMPLETED  
12-10-07

Please complete as many history profiles so that the total descriptions of products you manufacture account for production orders that reflect 70% of your business. History profiles are for board or board family (board types may be grounded together if they are similar).

BOARD TYPE multilayer	DATE OF ORDER 09-12-07	MATERIAL ISOLA	HISTORY # 2
VIA TYPE	PRODUCTION QUANTITY 30	TOTAL YEARLY PRODUCTION % 20	

Dimensions in millimeters (inches in brackets)

BOARD			HOLES		
BOARD SIZE DIAGONAL	TOTAL BOARD THICKNESS	NUMBER CONDUCTIVE LAYERS	DIA DRILLED HOLES	TOTAL PTH TOL (MAX-MIN)	LOCATION TOL DTP
<input type="checkbox"/> <250 [ $<10.00$ ]	<input type="checkbox"/> <1,0 [ $<.040$ ]	<input type="checkbox"/> 1-4 [1-4]	<input type="checkbox"/> >0,5 [ $>.020$ ]	<input type="checkbox"/> >0,250 [ $>.010$ ]	<input type="checkbox"/> >0,50 [ $>.020$ ]
<input type="checkbox"/> 250 [10.00]	<input type="checkbox"/> 1,0 [.040]	<input type="checkbox"/> 5-6 [5-6]	<input type="checkbox"/> 0,5 [.020]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,50 [.020]
<input type="checkbox"/> 350 [14.00]	<input type="checkbox"/> 1,6 [.060]	<input type="checkbox"/> 7-8 [7-8]	<input type="checkbox"/> 0,4 [.016]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,40 [.016]
<input type="checkbox"/> 450 [17.50]	<input type="checkbox"/> 2,0 [.080]	<input type="checkbox"/> 9-12 [9-12]	<input type="checkbox"/> 0,35 [.014]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,30 [.012]
<input checked="" type="checkbox"/> 550 [21.50]	<input type="checkbox"/> 2,5 [.100]	<input type="checkbox"/> 13-16 [13-16]	<input type="checkbox"/> 0,30 [.012]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,25 [.010]
<input type="checkbox"/> 650 [25.50]	<input checked="" type="checkbox"/> 3,5 [.135]	<input checked="" type="checkbox"/> 17-20 [17-20]	<input checked="" type="checkbox"/> 0,25 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,20 [.008]
<input type="checkbox"/> 750 [29.50]	<input type="checkbox"/> 5,0 [.200]	<input type="checkbox"/> 21-24 [21-24]	<input type="checkbox"/> 0,20 [.008]	<input checked="" type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,15 [.006]
<input type="checkbox"/> 850 [33.50]	<input type="checkbox"/> 6,5 [.250]	<input type="checkbox"/> 25-28 [25-28]	<input type="checkbox"/> 0,15 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,10 [.004]
<input type="checkbox"/> >850 [ $>33.50$ ]	<input type="checkbox"/> >6,5 [ $>.250$ ]	<input type="checkbox"/> >28 [ $>28$ ]	<input type="checkbox"/> <0,15 [.006]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input checked="" type="checkbox"/> <0,10 [ $<.004$ ]
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

### CONDUCTORS

INTERNAL ELEC CLEARANCE (MIN)	INTERNAL COND WIDTH (MIN)	INTERNAL PROCESS ALLOWANCE	EXTERNAL ELEC CLEARANCE (MIN)	EXTERNAL COND WIDTH (MIN)	EXTERNAL PROCESS ALLOWANCE	FEATURE LOCATION DTP
<input type="checkbox"/> >0,350 [ $>.014$ ]	<input type="checkbox"/> >0,250 [ $>.010$ ]	<input type="checkbox"/> >0,100 [ $>.004$ ]	<input type="checkbox"/> >0,350 [ $>.014$ ]	<input type="checkbox"/> >0,250 [ $>.010$ ]	<input type="checkbox"/> >0,100 [ $>.004$ ]	<input type="checkbox"/> >0,50 [ $>.020$ ]
<input type="checkbox"/> 0,350 [.014]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,350 [.014]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,50 [.020]
<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,40 [.016]
<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,30 [.012]
<input type="checkbox"/> 0,150 [.005]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,25 [.010]
<input type="checkbox"/> 0,125 [.005]	<input checked="" type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,030 [.0012]	<input type="checkbox"/> 0,125 [.005]	<input checked="" type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,030 [.0012]	<input type="checkbox"/> 0,20 [.008]
<input checked="" type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,025 [.001]	<input checked="" type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,025 [.001]	<input type="checkbox"/> 0,15 [.006]
<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,020 [.0008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,020 [.0008]	<input type="checkbox"/> 0,10 [.004]
<input type="checkbox"/> <0,075 [ $<.003$ ]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input checked="" type="checkbox"/> <0,020 [ $<.0008$ ]	<input type="checkbox"/> <0,075 [ $<.003$ ]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input checked="" type="checkbox"/> <0,020 [ $<.008$ ]	<input checked="" type="checkbox"/> <0,10 [ $<.004$ ]
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

# SECTION 6 (CHECK ONE IN EACH LINE THAT APPLIES)

## MANUFACTURING HISTORY (See Section 2 Site Capability)

DATE COMPLETED  
12-10-07

Please complete as many history profiles so that the total descriptions of products you manufacture account for production orders that reflect 70% of your business. History profiles are for board or board family (board types may be grounded together if they are similar).

BOARD TYPE Double sided	DATE OF ORDER 11-08-07	MATERIAL FR4	HISTORY # 3
VIA TYPE	PRODUCTION QUANTITY 80	TOTAL YEARLY PRODUCTION % 35	

Dimensions in millimeters (inches in brackets)

BOARD			HOLES		
BOARD SIZE DIAGONAL	TOTAL BOARD THICKNESS	NUMBER CONDUCTIVE LAYERS	DIA DRILLED HOLES	TOTAL PTH TOL (MAX-MIN)	LOCATION TOL DTP
<input type="checkbox"/> <250 [ $<10.00$ ]	<input type="checkbox"/> <1,0 [ $<.040$ ]	<input checked="" type="checkbox"/> 1-4 [1-4]	<input type="checkbox"/> >0,5 [ $>.020$ ]	<input type="checkbox"/> >0,250 [ $>.010$ ]	<input type="checkbox"/> >0,50 [ $>.020$ ]
<input type="checkbox"/> 250 [10.00]	<input type="checkbox"/> 1,0 [.040]	<input type="checkbox"/> 5-6 [5-6]	<input type="checkbox"/> 0,5 [.020]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,50 [.020]
<input type="checkbox"/> 350 [14.00]	<input checked="" type="checkbox"/> 1,6 [.060]	<input type="checkbox"/> 7-8 [7-8]	<input checked="" type="checkbox"/> 0,4 [.016]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,40 [.016]
<input type="checkbox"/> 450 [17.50]	<input type="checkbox"/> 2,0 [.080]	<input type="checkbox"/> 9-12 [9-12]	<input type="checkbox"/> 0,35 [.014]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,30 [.012]
<input type="checkbox"/> 550 [21.50]	<input type="checkbox"/> 2,5 [.100]	<input type="checkbox"/> 13-16 [13-16]	<input type="checkbox"/> 0,30 [.012]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,25 [.010]
<input type="checkbox"/> 650 [25.50]	<input type="checkbox"/> 3,5 [.135]	<input type="checkbox"/> 17-20 [17-20]	<input type="checkbox"/> 0,25 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,20 [.008]
<input checked="" type="checkbox"/> 750 [29.50]	<input type="checkbox"/> 5,0 [.200]	<input type="checkbox"/> 21-24 [21-24]	<input type="checkbox"/> 0,20 [.008]	<input checked="" type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,15 [.006]
<input type="checkbox"/> 850 [33.50]	<input type="checkbox"/> 6,5 [.250]	<input type="checkbox"/> 25-28 [25-28]	<input type="checkbox"/> 0,15 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,10 [.004]
<input type="checkbox"/> >850 [ $>33.50$ ]	<input type="checkbox"/> >6,5 [ $>.250$ ]	<input type="checkbox"/> >28 [ $>28$ ]	<input type="checkbox"/> <0,15 [.006]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input checked="" type="checkbox"/> <0,10 [ $<.004$ ]
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

### CONDUCTORS

INTERNAL ELEC CLEARANCE (MIN)	INTERNAL COND WIDTH (MIN)	INTERNAL PROCESS ALLOWANCE	EXTERNAL ELEC CLEARANCE (MIN)	EXTERNAL COND WIDTH (MIN)	EXTERNAL PROCESS ALLOWANCE	FEATURE LOCATION DTP
<input type="checkbox"/> >0,350 [ $>.014$ ]	<input type="checkbox"/> >0,250 [ $>.010$ ]	<input type="checkbox"/> >0,100 [ $>.004$ ]	<input type="checkbox"/> >0,350 [ $>.014$ ]	<input type="checkbox"/> >0,250 [ $>.010$ ]	<input type="checkbox"/> >0,100 [ $>.004$ ]	<input type="checkbox"/> >0,50 [ $>.020$ ]
<input type="checkbox"/> 0,350 [.014]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,350 [.014]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,50 [.020]
<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,40 [.016]
<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,050 [.002]	<input checked="" type="checkbox"/> 0,200 [.008]	<input checked="" type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,30 [.012]
<input type="checkbox"/> 0,150 [.005]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,25 [.010]
<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,030 [.0012]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,030 [.0012]	<input type="checkbox"/> 0,20 [.008]
<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,025 [.001]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,025 [.001]	<input type="checkbox"/> 0,15 [.006]
<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,020 [.0008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,050 [.002]	<input checked="" type="checkbox"/> 0,020 [.0008]	<input type="checkbox"/> 0,10 [.004]
<input type="checkbox"/> <0,075 [ $<.003$ ]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input type="checkbox"/> <0,020 [ $<.0008$ ]	<input type="checkbox"/> <0,075 [ $<.003$ ]	<input type="checkbox"/> <0,050 [ $<.002$ ]	<input type="checkbox"/> <0,020 [ $<.008$ ]	<input checked="" type="checkbox"/> <0,10 [ $<.004$ ]
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

DATE COMPLETED
----------------

# SECTION 7

## IDENTIFICATION OF PREVIOUS AUDITS (Optional)

Please complete as many forms as you feel reflect the intensity of your customer visits.

COMPANY AUDITORS	DATE OF AUDIT
AUDIT TEAM MEMBERS	AUDITOR REMARKS
	SPECIFICATIONS USED IN AUDIT
LENGHT OF AUDIT	
TEAM MEMBERS MAY BE CONTACTED AT	
COMPANY AUDITORS	DATE OF AUDIT
AUDIT TEAM MEMBERS	AUDITOR REMARKS
	SPECIFICATIONS USED IN AUDIT
LENGHT OF AUDIT	
TEAM MEMBERS MAY BE CONTACTED AT	
COMPANY AUDITORS	DATE OF AUDIT
AUDIT TEAM MEMBERS	AUDITOR REMARKS
	SPECIFICATIONS USED IN AUDIT
LENGHT OF AUDIT	
TEAM MEMBERS MAY BE CONTACT AT	

\*REPEAT THIS FORM AS NECESSARY

# SECTION 8

## FINANCIAL REVIEW (OPTIONAL)

DATE COMPLETED
----------------

Please complete the following financial information that coincides with the company description and site information provided in section 1.

### COMPANY FINANCIAL DESCRIPTION

LEGAL NAME		
TAXPAYER ID NUMBER	DUNS NUMBER	TRADING SYMBOL
ANNUAL SALES	PRIOR YEAR	YEAR-TO-DATE
FISCAL YEAR		
BANK	ACCOUNT NUMBER	
BANK ADDRESS	STATE	ZIP
PROVINCE	COUNTRY	
BANK TELEPHONE NUMBER	FAX NUMBER	
COMMENTS		

### SITE FINANCIAL DESCRIPTION

SITE NAME		
TAXPAYER ID NUMBER	DUNS NUMBER	TRADING SYMBOL
ANNUAL SALES	PRIOR YEAR	YEAR-TO-DATE
FISCAL YEAR		
BANK	ACCOUNT NUMBER	
BANK ADDRESS	STATE	ZIP
PROVINCE	COUNTRY	
BANK TELEPHONE NUMBER	FAX NUMBER	
COMMENTS		

# SECTION 9

## MQP ELECTRONIC EDITING

This MS Word template comes with editable fields. IPC has made this electronic document available for ease of completing, updating, and filing the MQP, as well as to give the laminate manufacturer and customer a common interface. Using the template enables laminate manufacturers to maintain several customer specific files without the endless stream of paperwork.

Editable fields are highlighted in gray. To complete the fields in the template, use the TAB key to toggle from field to field, entering the information as instructed in the introductory text for each section.

The developers of this MQP strongly suggest the person at the laminate manufacturing facility responsible for creating and maintaining the MQP write protect the file to be sent.

## ATTACHMENT 1

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## Facility List

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CAD/CAM DEPARTMENT:

- NEW!** 3 CAM Stations from Innoveda(FAB Factory and CAM350 V9.0.
- NEW!** 1 Gerber Scientific Crescent 30 Laser Photoplotter
- NEW!** 1 Kodak film developer
- 1 Agfa Raliline 66-3HT Silver Film Developer with Auto replenisher System

ART DEPARTMENT:

- 1 Nuarc Fliptop Plate Maker FT26V3UPNS
- 1 Nuarc Fliptop Plate Maker FT26V2UP
- 1 Technilith Diazo developer Model 6000
- 2 Film Inspection Stations
- 1 Film Densitometer

LASER STENCIL DEPT:

- NEW!** LPKF Laser machine

DRILLING AND FABRICATION:

- NEW!** 7 Pluritec fully automatic modular Drilling machine
- NEW!** 1 Pluritec Maxima 5 head Driller/Router
- NEW!** 1 Pluritec MEGA 6 head Driller Model 400
- NEW!** 1 Excellon system 2000 4-Head Drilling with High speed spindles
- 2 Tulon Drill Sharpeners with Microscopes
- 1 Barnaby stackmaster
- 1 Wysong Laminate Shear Model 1652
- 1 Panel Depanelizer
- 1 Depinner
- 1 Arbor Press
- NEW!** 1 Glenbrook Technology Real Time X-Ray System XR113
- 1 PDA 4 head routing machines
- NEW!** 1 Filotec SM-30 NC Scoring machine with auto 90 degree turn
- 2 Beveling Machines
- 1 Slotter
- 1 Miller Bridgeport
- 2 Spenser Dust collector

IMAGING:

- 2 Colight 30 8 KW exposures
- NEW!** 1 Colight 1530 5 KW exposures
- 1 Dynachem Cut Sheet Film Laminator
- NEW!** 1 DP1500 Double Screen Automatic Screen Coater
- 1 BASSI Thermomatic Tunnel Oven
- 3 Various model Developers
- 1 Dynachem 300 manual hot roll laminator
- 1 Liebert Climate controller for Clean Room Environment
- 1 Teknek Panel Cleaner CM III

1 Teknek Panel Cleaner CM 6  
 1 Dynachem Preheater Model 800  
 1 Film Densitometer  
 34 Glass Registration Tools  
 2 Dupont Riston Film Registration System  
 1 Multiline Multilayer Registration Film Punch  
 3 Precision Quincy ovens  
 1 Air Vac Central Vacuum System  
 1 Tornado Solder mask Mixer  
 1 Chemcut 547-30 Developer  
 1 Chemcut 547-24 developer  
 1 VCM vertical developer

**SCREENING:**

**NEW!** 1 ARGON automated screen printing machine  
**NEW!** 1 SVACIA automated screen printing machine  
 2 Manual Screen Printing Tables  
 1 NUARC Fliptop Plate maker FT26V3UPNS  
 2 Screen Making & reclaiming Wet Booths  
 1 Dynachem UV Cure Oven UVEX  
 20 Screen Frames, Various sizes

**WET PROCESS:**

1 TNT 27 Tank Automatic Electroless Copper Plating Line with Desmear & Etchback Units  
 1 Baker Brothers 30 Tank Automatic Electrolytic Plating Line  
 1 Technic Automatic Nickel/Gold plating Line  
 1 Dalux Etching machine  
 1 DEM Tin/Lead Strip line  
 1 Argus International Hot air leveler Model 5124  
**NEW!** 1 FSL Shadow horizontal conveyORIZED electroless process line  
 1 Wessero Deburrer  
 1 Western Tech preclean line  
 1 IS Post Clean line with 9 ft cooling conveyor  
 1 Chemcut 547-30 Developer  
 1 Chemcut 547-24 developer  
 1 VCM vertical developer  
 1 Toryon Dry Film Plating Resist Stripper with F2000 Film separator  
 1 IS screened plating resist stripper  
 1 Chemcut DI water Final Rinse System  
 1 Marseco Blue Boy small part washer  
 2 ESI loaders  
 1 Amtech loader  
 1 Mutlilayer Inner layer Oxide Line with "DMAB" post dip  
 1 Deionized water System  
 1 Organic Solderability protection (OSP) Line  
 1 **NEW!** 1 Electroless Nickel/ Immersion Gold (ENIG) Line  
 1 **NEW!** 1 Immersion Silver Line  
 1 **NEW!** 1 ISHIHIYOKI Scrub machine  
 1 **NEW!** 1 Immersion Tin Line  
 1 **NEW!** 1 OSP Surface finish Line  
 3 Dynachem stackers  
 1 Toryon Chemclean Line for Multilayer Cores

- 1 IS Pumice Scrubber
- 1 Temprite Water Chiller
- 1 Western Tech dryer
- 1 ASI Stacker

MULTILAYER :

- 1 TMP 175 tons, six opening vacuum assisted lamination press
- 1 Wabash six opening cool down press
- 1 Wabash 125 tons, three opening press PCI 25, 24'x24" 4 Ton
- 1 Cool down press with 3 openings
- 1 Multiline Acculine inner layer punch
- 2 Baking Ovens
- 1 Lay Up Station
- 1 Presto Electric Lift
- Mania MPP4504 Flying Probe Tester S/N 550398 1 Water Chiller Application Engineering DSA 5CH
- 1 Overarm Micrometer for Multilayer panels.
- 1 Climate Controlled Storage Facility for Prepregs
- 1 Layup clean room with HEPA filters

QUALITY CONTROL AND INSPECTION:

- NEW!** 1 Probot 880 Flying Prob Fixtureless testing machine
- 1 ATG 2000, double side, double density Bare Board Electrical Testing Machine
- NEW!** 1 ATG 3x, Flying Prob Electrical Testing Machine
- 1 ATG 1200, Bare Board Electrical Testing Machine
- NEW!** 2 Camtek CAM -V50 Automatic Optical Inspection Machine
- 1 Complete Set of Micro section Equipment
- NEW!** 2004 Mania 580 Flying Probe Tester with Camera, model MPP6504 S/N 800152
- NEW!** Mania MPP4504 Flying Probe Tester S/N 550214
- NEW!** Mania MPP4504 Flying Probe Tester S/N 550398
- 1 Fully equipped in house chemical laboratory
- NEW!** 1 Dionex ION Chromotography System DX-120
- NEW!** 1 Veeco XRF-5300L X-RAY Measurement System for Gold and Nickel Thickness measurement
- 20 Barcode Tracking system at every process step for Statistical Process Control.
- 1 MCW550 Hughes System, Cu Welding Machine
- NEW!** Mark V Lab, Microscope with Color Picture capability for the Cross-sections
- 4 Sets Block gauges
- 3 Sets of Pin Gauges
- 1 Solder Float pot
- 8 Vernier Calipers Various Sizes
- 6 Micrometers Various Sizes
- 1 Ohaus Scale with weight set
- Microscopes various sizes
- Granite Surface Plate
- 1 Oxford CMI 600 PTX copper thickness measuring system
- 10 In process 2nd final quality inspection stations

MANAGEMENT & PLANT SUPPORT:

- NEW!** 1 State of the art CIM software package - BACON® by Bacon Software, Inc. - with integrated network.
- 1 Haviland complete WasteWater Treatment facility. 100% EPA Compliant processes.
- Air Compressor Quincy 100HP

Air Compressor Joy 50 HP  
2 Air compressors Kaeser 30 HP each.  
1 Air compressors Kaeser 75 HP each.  
4 Air Dryers  
1 Bessler Shrink Wrap Packaging Machine  
3 Pallet Jacks  
1 Maintenance Shop- fully equipped with shop machines and hand tools  
1 Hyster Fork Lift truck  
25 Computers  
3 Dell Servers  
1 Meridian Phone system with personal voice mails  
1 High speed T1 line hardware for internet and phones  
1 Complete Manufacturing software from Bacon for production control and QC

## ATTACHMENT 2

## A. LIST OF EQUIPMENT/INSTRUMENT FOR GROUP "A"

Equipment	Equipment I.D.	Calibration Frequency	Calibration Performed		Calibration Procedure	Location
			IN HOUSE	OUTSIDE		
Micrometer	DRL-001	Yearly	X		1	Drilling
Micrometer	DRL-002	Yearly	X		1	Drilling
Micrometer	DRL-003	Yearly	X		1	Drilling
Micrometer	DRL-004	Yearly	X		1	Drilling
Cu Thickness Chk	DRL-CU-1	Yearly	X		14	Drilling
V-Depth Check	2416	Yearly	X		5	Scoring
Calipers 12"	008288	Yearly	X		2	Score/Route
Calipers 12"	0008286	Yearly	X		2	Routing
Micrometer	M-25	Yearly	X		1	QC Office
Micrometer	293 768 30	Yearly	X		1	Final Insp.
Calipers 6"	INSPC0066	Yearly	X		2	Final Insp.
Calipers 12"	7013380	Yearly	X		2	Final Insp.
Calipers 24"	7000713	Yearly	X		2	Final/Route
Pin Gage .011-.060	INSPC003	Yearly	X		3	Final Insp.
Pin Gage .061-.250	INSPC0007	Yearly	X		3	Final Insp.
Pin Gage .061-.250	INSPC65	Yearly	X		3	Final Insp.
Pin Gage .061-.250	QC 110	Yearly	X		3	Final Insp.
Pin Gage .011-.060	ENG-001	Yearly	X		3	Engineering
Pin Gage .011-.060	ENG-002	Yearly	X		3	Engineering
Pin Gage .061-.250	ENG-003	Yearly	X		3	Engineering
Hole Location Gage	A72595	5 Years		X		QC Storage
Surface Plate	SP-1	3 Years		X		QC Storage
Gage Block 6"	850227	3 Years		X		QC Storage
Gage Block .016	970514	3 Years		X		QC Storage
Gage Blocks 12"	H901	3 Years		X		QC Storage
Gage Blocks 12"	H912	3 Years		X		QC Storage
Gage Block Set .0625-3.0"	732295	3 Years		X		QC Storage
ATG Test Machine	001100a3065	2 Years		X		E.T. Area
A1200 E.T. Machine	9309 1200 034	2 Years		X		E.T. Area
A1000 E.T. Machine	9106 2000 094	2 Years		X		E.T. Area
XRF-53002	XRF-01	Yearly	X		17	Final Insp.

**B. LIST OF EQUIPMENT/INSTRUMENT FOR GROUP “B”**

Equipment	Equipment I.D.	Calibration Frequency	Calibration Performed		Calibration Procedure.	Location
			IN-HOUSE	OUTSIDE		
Primary Developer	PR DEV-1	Yearly	X		7	Image Dept
Primary Developer	PR-DEV-2	Yearly	X		7	Image Dept
Film Developer	DIAZO 1	Yearly	X		9	Art Room
LPI Developer	LPI DEV-1	Yearly	X		7	Screening
Laminator (Manual)	LAM-001	Yearly	X		8	Image Dept
CSL Laminator	LAM-CSL	Yearly	X		8	Image Dept
Densitometer	000647	Yearly	X		6	Art Room
IR Thermometer	0S201F	2 Years	X		22	Lamination

**C. LIST OF EQUIPMENT/INSTRUMENT FOR GROUP “C”**

Equipment	Equipment I.D.	Calibration Frequency	Calibration Performed		Calibration Procedure	Location
			IN-HOUSE	OUTSIDE		
Thermocouple	367124	2 Years	X		13	Plating
CMI-PTX-300 Cu Thkns.	NEW 1-99	Yearly	X		14	Plating
Temperature Gauges on Desmear Line	2-DSM 4-DSM 7-DSM	Yearly	X		7	Desmear Line
Rectifier on Desmear Line	DSMREC 2	Yearly	X		10	Plating
Temperature Controllers on Black Oxide Line	OXTMP-1 OXTMP-4 OXTMP-9 OXTMP-12	Yearly	X		7	Oxide Line
Oxide Oven	OVN 4	Yearly	X		12	Oxide Line
OXIDE Manual Timer	BOXMNT	Yearly	X		9	Oxide Line
Oxide Timers	1, 4 & 9	Yearly	X		9	Oxide Line
Etch Temp Controller	ETCHTMP-1	Yearly	X		7	Etcher
Resist Strip Temp. Controller	RSTEMP-1	Yearly	X		7	Resist Stripper
HAL Temp Controller	HALTMP-1	Yearly	X		7	HAL Argus
HAL Temp Controller	HALTMP-2	Yearly	X		7	HAL Avalon
ENIG Temp Controllers	Tank-1	Yearly	X		7	ENIG Line
	Tank-4					
	Tank 7					
	Tank 11					
	Tank 14					
	Tank 17					
	Tank 18					
OSP Temp Controller	Tank 1A					
Tin Strip Temp Control	TINTMP-1	Yearly	X		7	Tin Stripper
Chem Clean Temperature Controller.	TMPCHEM	Yearly	X		7	Chem Clean
Gold Temperature Controller	AU-HTR	Yearly	X		7	Gold Line
Nickel Temperature Controller	NI-HTR	Yearly	X			
Gold Rectifier Nickel Rectifier	AUREC-1 NIREC-1	Yearly	X		10	Gold Line

(GROUP C CONTINUED ON NEXT PAGE)

C. LIST OF EQUIPMENT/INSTRUMENT FOR GROUP "C" (Continued)

Equipment	Equipment ID Station	Calibration Frequency	Calibration Performed		Calibration Procedure	Location
			IN-HOUSE	OUTSIDE		
<i>ENIG Timers</i>	Tank 1	One year	X		9	ENIG Line
	Tank 2					
	Tank 3					
	Tank 4					
	Tank 5					
	Tank 6					
	Tank 7					
Rectifier 1	19	Six Months	X		10	Baker Plating Line
Rectifier 2	20					
Rectifier 3	21					
Rectifier 4	22					
Rectifier 5	23					
Rectifier 6	24					
Rectifier 7	25					
Rectifier 8	26					
Rectifier 9	27					
Rectifier 10	28					
Rectifier 11	29					
Rectifier 12	30					
Rectifier 13	7					
Rectifier 14	9					
Temperature Gauge	2	Yearly	X		7	Baker Plating Line
Temperature Gauge	7-8-9					
Temperature Gauge	10					
Temperature Gauge	11					
Temperature Gauge	14					
Temperature Gauge	19-20					
Temperature Gauge	21-22					
Temperature Gauge	23-24					
Temperature Gauge	25-26					
Temperature Gauge	27-28					
Temperature Gauge	29-30					
Temperature Gauge	9	Yearly	X		7	Electroless Line
Temperature Gauge	11					
Temperature Gauge	17					
Temperature Gauge	20					
Temperature Gauge	26					
Temperature Gauge	27					

## D. LIST OF EQUIPMENT/INSTRUMENT FOR GROUP "D"

Equipment	Equipment I.D.	Calibration Frequency	Calibration Performed		Calibration Procedure	Location
			IN-HOUSE	OUTSIDE		
Tension Meter	8806667	Yearly	X		11	Screening
Oven 1	OVN-1	Yearly	X		12	Screening
Oven 2	OVN-2	Yearly	X		12	Screening
Oven 3	OVN-3	Yearly	X		12	Screening
Oven 1 Timer	OVNTM-1	Yearly	X		9	Screening
Oven 2 Timer	OVNTM-2	Yearly	X		9	Screening
Oven 3 Timer	OVNTM-3	Yearly	X		9	Screening
U.V. Monitor	CURUV00	Yearly		X	N/A	Screening
Tunnel Oven Temperature Gauge	SCN 001	Yearly	X		4	LPI Screening
Timer Manual	MANTIM-1	Yearly	X		9	Char. Screening
Timer Manual	MANTIM-2	Yearly	X		9	LPI Developing
Timer Manual	LPINKTIMR	Yearly	X		9	LPI Screening

## E. LIST OF EQUIPMENT/INSTRUMENT FOR GROUP "E"

Equipment	Equipment I.D.	Calibration Frequency	Calibration Performed		Calibration Procedure	Location
			IN-HOUSE	OUTSIDE		
pH Meter	QC-001	Six Months	X		15	Q.C. Lab
Master Timer	QC-002	Yearly	X		20	Q.C. Office
Certified Thermometer	72JX0292	Three Years		X		Q.C. Office
Microscope	QC MIC 1	Yearly	X		23	Qc Lab
Rectifier	QC-REC	Yearly	X		10	Q.C. Lab
Weighing Scale	NEWSCL 3340	Yearly	X		16	Q.C. Lab
Weight Standards	7555 & 12213	5 Years		X		Q.C. Office
Densitometer Stnd	A101857	Three Years		X		Q.C. Lab
<b>Lab Ware (Complete List on next page)</b>	GLASSWARE	Until Breakage	X		19	Q.C. Lab
Solder Pot	QC129	Yearly	X		18	Q.C. Lab
Timer	LAB-TIMER	Yearly	X		9	Q.C. Lab
Cntr. Hole Micromtr	A72595	Five Years		X		Q.C. Office
Glass Thermometer	T-1	Until Breakage	X		21	Q.C. Lab
Glass Thermometer	T-2	Until Breakage	X		21	Q.C. Lab
Glass Thermometer	T-3	Until Breakage	X		21	Q.C. Lab
Thermocouple	INSPC0052	2 Year	X		13	Q.C. Lab
ML-Press-Wabash	W7033	Yearly		X		MLB Area
ML Press Tmp	474686	Yearly		X		MLB Area
ML Press Timer Kiss, Cure, Cool	474686-TIM	Yearly		X		MLB Area
ML Press Pressure Kiss, Cure	W7033-TIM	Yearly		X		MLB Area
Oven 5	OVN-5	Yearly	X		12	MLB Area
Oven Timer	OVNTM-5	Yearly	X		9	MLB Area
Micrometer Mlb	INSPC0033	Yearly	X		1	MLB Area
PNC Cu Thk Stnd	C1/1 & C 2/2	Indefinite	X		14	Q C Office
CMI Stndrds. Cu Thk,	3-1750	Yearly		X		Q C Lab
P H Buffer Tendars	CONSUMABLE	Replaced		X		Q C Lab
Xrf 5300I Au/Ni Measr.	5300L-0127	Two Years		X		Q C Lab
Clampmeter/Amprobe	517646	Two Years		X		Q.C. Lab
Glass Scale Stnd. For Microscope Simco	MICRO-1	Three Years		X		Q.C. Lab
Hand held Microscope	QC MIC-2	Yearly	X		23	Final Insp.

**LIST OF EQUIPMENT/INSTRUMENT FOR GROUP “E” (CONT.)**

LIST LAB GLASSWARE:

LOCATION: Q.C.LAB

CALIBRATION FREQUENCY: ONCE

EQUIPMENT REQUIRED: CALIBRATED GRADUATED CYLINDERS

No.	Lab Glass Ware	Size	Minimum Graduation
1	Pipets	1 ML	N/A
		2 ML	N/A
		5 ML	N/A
		10 ML	N/A
		20 ML	N/A
		25 ML	N/A
		50 ML	N/A
2	Graduated Pipets	1.0 ML	0.1 ML
		2.0 ML	0.1 ML
		5.0 ML	0.1 ML
		10.0 ML	0.1 ML
3	Burettes	0 TO 50 ML	0.1 ML
4	Volumetric Flask	100 ML	N/A
		500 ML	N/A
		1,000 ML	N/A
5	Graduated Cylinders	0 TO 25 ML	N/A
		0 TO 50 ML	N/A
		0 TO 100 ML	N/A
		0 TO 250 ML	N/A
		0 TO 500 ML	N/A
		0 TO 1500 ML	N/A
		0 TO 4,000 ML	N/A