



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**

The IPC is indebted to the members of the OEM council who participated in the development of this document. A note of thanks is also expressed to the members of the IPC Presidents Council for their review and critique and construction recommendations in finalizing the principles developed for the MQP.

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# SECTION 1.1

## COMPANY DESCRIPTION

DATE COMPLETED April 18, 2011
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### GENERAL INFORMATION

LEGAL NAME Pho-Tronics, Inc.			
PHYSICAL ADDRESS 8701 West Bradley Road			
CITY Milwaukee	STATE WI	ZIP 53224	
PROVINCE Milwaukee	COUNTRY USA		
TELEPHONE NUMBER 414-355-5300	FAX NUMBER 414-355-0593	TELEX NUMBER	
E-MAIL ADDRESS sales@pho-tronics.com	MODEM NUMBER	DATE FOUNDED 1963 PRIVATE	
INTERNET URL www.pho-tronics.com	FTP SITE Pho-Tronics.com or password assigned		

### MANAGEMENT

PRESIDENT Paul D Godbout
CHIEF OPERATING OFFICER Paul Godbout
VICE PRESIDENT OF MANUFACTURING Nick Koutsios
VICE PRESIDENT OF QUALITY Donna Deberge
VICE PRESIDENT OF MARKETING/SALES Jeffrey Godbout
VICE PRESIDENT OF CUSTOMER SERVICE
WASTE TREATMENT MANAGER (POLLUTION PREVENTION) Mark Skaros

### CORPORATE

### NUMBER OF EMPLOYEES

DESCRIPTION	CORPORATE	SITE	COMMENTS
DESIGN AND DEVELOPMENT	1		
ENGINEERING	10		
MANUFACTURING CONTROL	1		
MANUFACTURING	DIRECT	45	
	INDIRECT	8	
QUALITY CONTROL	QUALITY ENGINEERS	2	
	INTERNAL AUDITORS		Not dedicated personnel
	GENERAL MANAGEMENT	1	
ADMINISTRATION	4		
<b>TOTAL</b>	<b>72</b>		

# SECTION 1.2

## SITE DESCRIPTION

(TO BE COMPLETED FOR EACH SITE)

 DATE COMPLETED **April 18, 2011**  
 ATTACH APPROPRIATE CHARTS (OPTIONAL)

MANUFACTURING FACILITY			
COMPANY NAME		Pho-Tronics, Inc.	
PHYSICAL ADDRESS 8701 West Bradley Road			
CITY Milwaukee	STATE WI	ZIP 53224	
PROVINCE Milwaukee	COUNTRY USA		
TELEPHONE NUMBER 414-355-5300	FAX NUMBER 414-355-0593	TELEX	
E-MAIL ADDRESS sales@pho-tronics.com	MODEM NUMBER	YEARS IN BUSINESS 51	
INTERNET URL www.pho-tronics.com	FTP pho-tronics.com or assigned password		
PRINCIPLE PRODUCTS/SERVICES/SPECIALTIES Rigid Multi-Layer Printed Circuit Boards thru 24 layers Specialty materials BT, Polyimide, Taconic, Rogers, low DK	BUSINESS CHARACTERIZATION (HIGH VOLUME, QUICK TURN-AROUND, ETC.) High Mix - Prototype through Production		

FACILITY MANAGEMENT	TITLE	REPORTS TO (Function/Job Title)
OVERALL OPERATION RESPONSIBILITY FOR THIS SITE Paul Godbout	COO	President
MANUFACTURING Nick Koutsios	Production Manager	President
TECHNICAL/ENGINEERING Bryan Gahn	Engineering Manager	President
MATERIALS/PRODUCTION CONTROL Judy Thielecke	Production Control/Materials Mgr.	Production Manager
PURCHASING Tim Trier	Purchasing	President
QUALITY Donna Deberge	Quality Manager	President
SALES REPRESENTATIVE Bobbie Rodriguez	Sales Manager	President
WASTE MANAGEMENT Mark Skaros	Chemical Technician	Engineering Manager

BUILDINGS	AGE	AREA (Sq. Ft.)	Construction (Wood/Brick)	SYSTEMS (INDICATE % COVERAGE)						
				Power Conditioning	Heating	Ventilation	Air Conditioning	Sprinklers	Waste Treatment	Other
Office	34	5000	Brick	100	100	100	100	100	0	
Manufacturing	34	5500 0	Brick	100	100	100	60	100	100	
Storage	34	5000	Brick	100	100	100	5	100	0	
Planned additions	0									

SAFETY AND REGULATORY AGENCY REQUIREMENTS			
Are fire extinguishers functional and Accessible to employees?	X YES	<input type="checkbox"/> NO	What is the distance to the nearest fire station? (in minutes) 2 Minutes {3 city Blocks}
Do you conform to local/federal environment protection agency requirements?	X YES	<input type="checkbox"/> NO	Date of last OSHA visit 2006 Date of last EPA visit NEVER
Are you currently operating under a waiver or in violation of local government requirements?	YES	X NO	Other Agency Audits, UL, ISO 9000, NECQ, CSA Approval and Number X UL # E35174 x ISO 9000# 2008 X AS 9100 Rev. C x Other Mil 55110
Do you have a safety program? Describe below.	X 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)
72	0	5	10	45	12	0		x		

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# SECTION 2.1 PROCESS

DATE COMPLETED 4.18.11
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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 checked="" type="checkbox"/> Thin Foil Subtractive less than .5 oz. <input type="checkbox"/> Semi-Additive <input checked="" type="checkbox"/> Additive (Electro-less) <input checked="" type="checkbox"/> Direct Metalization MacDermid Eclipse <input type="checkbox"/> Thick Film Paste and Fire <input type="checkbox"/> Thin Film Semi-conductor Sputtering <input type="checkbox"/> Other:	Cupric I/L Etch & Amonia O/L Etch          MacDermid Eclipse / Fluid Head Mechanicals
B	PTH Materials and Processes	<input checked="" type="checkbox"/> Acid Copper <input type="checkbox"/> Pyro-Phosphate Copper <input checked="" 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 other:	
C	Permanent Over-plating	<input checked="" type="checkbox"/> Tin <input type="checkbox"/> Tin-Lead <input type="checkbox"/> Tin-Nickel Alloy <input checked="" 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	<p>X Tin</p> <p><input type="checkbox"/> Tin-Lead</p> <p><input type="checkbox"/> Tin-Nickel Alloy</p> <p>X Nickel</p> <p>X Nickel Gold (Hard)</p> <p>X Nickel Gold (Soft)</p> <p><input type="checkbox"/> Nickel Rhodium</p> <p>X Other: Immersion Silver</p>	
E	Permanent Mask or Coating	<p>X Photo Dry Film</p> <p>X Photo Liquid</p> <p>X Image Transfer Screen Mask</p> <p>X Conformal Coating Solder Mask</p> <p><input type="checkbox"/> Cover Coat</p> <p><input type="checkbox"/> Other:</p>	<p>Primary circuitry imaging</p> <p>Soldermask</p> <p>Silkscreened Legend</p> <p>Soldermask</p>
F	Other Surface Finishes	<p><input type="checkbox"/> Tin-Lead Fused</p> <p>X Immersion Tin</p> <p>X Solder Leveled</p> <p><input type="checkbox"/> Roll Soldered</p> <p><input type="checkbox"/> Electro-less Solder Fused</p> <p><input type="checkbox"/> Solder Bumped Lands</p> <p><input type="checkbox"/> Solder Paste Fused</p> <p>X Azole Organic Protective Covering</p> <p><input type="checkbox"/> Flux Protective Covering</p> <p>X Other: Immersion Silver</p> <p>X Immersion nickel/gold</p>	

# SECTION 2.2

## ELECTRICAL TEST EQUIPMENT

DATE COMPLETED 4.18.11
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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 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 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] 0.40 [.016] <input type="checkbox"/> 0.30 [.012] 0.20 [.008] <input type="checkbox"/> X <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 checked="" 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 checked="" type="checkbox"/> 0.075 [.003] <input checked="" type="checkbox"/> <0.075 [.003] <input type="checkbox"/> Other:	
F	Grid Density	<input checked="" type="checkbox"/> Single Side Grid <input checked="" 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:	

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

# SECTION 2.3

## PRODUCT TYPE

DATE COMPLETED 4.18.11
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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 checked="" type="checkbox"/> Other: Taconic, Rogers – low loss materials
B	Circuit Mounting Type	<input checked="" type="checkbox"/> Single Sided <input checked="" type="checkbox"/> Double Sided <input checked="" type="checkbox"/> Multilayer <input checked="" type="checkbox"/> Single-sided Bonded to Substrate <input checked="" type="checkbox"/> Double-sided Bonded to Substrate <input checked="" type="checkbox"/> Multilayer Bonded to Substrate <input checked="" type="checkbox"/> Constrained Multilayer <input type="checkbox"/> Distributed Plane Multilayer <input type="checkbox"/> Other:
C	Via Technology	<input checked="" 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 checked="" type="checkbox"/> Other: Filled Vias

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

H	Coatings and Markings	<p>X <math>\leq 0.1</math> mm Mask Clearance</p> <p>    &gt;0.1 mm Mask Clearance</p> <p>X One Side (Legend)</p> <p>X Two Side (Legend)</p> <p><input type="checkbox"/> None (Legend)</p> <p>X UL Material Logo</p> <p>X U.L. V<sub>0</sub> Logo</p> <p><input type="checkbox"/> U.L. V<sub>1</sub> Logo</p> <p><input type="checkbox"/> U.L. V<sub>2</sub> Logo</p> <p><input type="checkbox"/> Other:</p>	



# SECTION 2.4

## PRODUCT COMPLEXITY

DATE COMPLETED  
4.28.2011

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

D	Dia Drilled Holes	>0,5 [.020] 0,5 [.020] 0,4 [.016] 35 [.014] 30 [.012] 25 [.010] 20 [.008] 0.15 [.006] X <0,15 [.006] <input type="checkbox"/> Other:	
E	Total PTH TOL (Max-Min)	>0,250 [.010] 0,250 [.010] 0,200 [.008] 0,150 [.006] 0,125 [.005] 0,100 [.004] 0,075 [.003] X 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] 0,10 [.004] x <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] 0,100 [.004] X 0,075 [.003]	

		<input type="checkbox"/> <0,075 [.003] <input type="checkbox"/> Other:	
H	Internal 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 type="checkbox"/> 0,100 [.004] <input checked="" type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	
J	Internal 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 type="checkbox"/> 0,025 [.001] <input type="checkbox"/> 0,020 [.0008] <input checked="" type="checkbox"/> <0,020 [.0008] <input type="checkbox"/> Other:	

K	External 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 [.006] <input type="checkbox"/> 0,125 [.005] <input type="checkbox"/> 0,100 [.004] <input type="checkbox"/> X 0,075 [.003] <input type="checkbox"/> <0,075 [.003] <input type="checkbox"/> Other:	
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 type="checkbox"/> 0,100 [.004] <input type="checkbox"/> X 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 type="checkbox"/> X 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 checked="" type="checkbox"/> 0,10 [.004] <input type="checkbox"/> <0,10 [.004] <input type="checkbox"/> Other:	
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All Dimensions are in millimeters [inches shown in brackets]

# SECTION 2.5

## QUALITY DEVELOPMENT

DATE COMPLETED 4.28.2011
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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	X Functional Steering Committee Formed X TQM Plan & Philosophy Established & Published X Documented Quality Progress Review X Implementation & review of Project Team Recommendations XTQM Communicated throughout organization X Controlled New process Start-up X Management Participates in TQM Audits X Employee Recognition Program <input type="checkbox"/> Total TQM Plan/Involvement Customer Training <input type="checkbox"/> Other:	
B	Employee Involvement	X Certified Training Available X Training of Employee Base X TQM Team Trained <input type="checkbox"/> Design of Experiment Training and Use X New Process Implementation Training X Support Personnel Training X Advanced Statistical Training XQuality Functional Deployment X Ongoing Improvement Program for Employees <input type="checkbox"/> Other:	
C	Quality Manual	X Quality Manual Started X Generic Quality Manual for Facility X 10% of manufacturing depts. have process specifications X 25% of manufacturing depts. have process specifications X 50% of manufacturing depts. have process specifications X Non-manufacturing Manuals Developed X 25% of all departments have quality manuals X 50% of all departments have quality manuals X All Manufacturing and support depts. have controlled quality manual <input type="checkbox"/> Other:	

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

		X ISO-9001 X Other: AS9100	
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## SECTION 3

### EQUIPMENT PROFILE (Pre-Site Audit)

DATE COMPLETED  
4.28.2011

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

3.1 PHOTOTOOL CAPABILITY	YES	NO	EQUIPMENT	NO. EQUIPMENT UNITS	EQUIPMENT LIMITS
A) AOI of phototool	X	<input type="checkbox"/>	Camtek	1	
B) AOI CAD reference (CAM)	X	<input type="checkbox"/>	Camtek		
C) Photoplotting	X	<input type="checkbox"/>	Barco	1	
D) Photo reductions	X	<input type="checkbox"/>	Barco	1	
E) Film scan and conversion	X	<input type="checkbox"/>	Outsourced		
F) Film processing <input type="checkbox"/> air-dried <input type="checkbox"/> force-dried X processed in automatic processor	x	<input type="checkbox"/>	DuPont		
G) Media types X silver halide film <input type="checkbox"/> glass X diazo	x	<input type="checkbox"/>			

3.2 DRILLING EQUIPMENT	YES	NO	EQUIPMENT	NO. EQUIPMENT UNITS	EQUIPMENT LIMITS
A) Manual	<input type="checkbox"/>	X			
B) Optical (single spindle)	<input type="checkbox"/>	X			
C) N.C. drill	X	<input type="checkbox"/>	Excellon POSALUX	5 2	250k Spindle speed; contact drilling/ control depth

3.3 ROUTING EQUIPMENT	YES	NO	EQUIPMENT	NO. EQUIPMENT UNITS	EQUIPMENT LIMITS
A) Edge beveler	X	<input type="checkbox"/>		2	
B) Hand router (pin router)	X	<input type="checkbox"/>		1	
C) N.C. router	X	<input type="checkbox"/>	Excellon	2	
D) N.C. driller/router	X	<input type="checkbox"/>	Excellon	1	



E) Scoring (profile)	X	<input type="checkbox"/>	Accuscore	1	
F) Scoring (straight line)	X	<input type="checkbox"/>	Accuscore		

3.4 MECHANICAL EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT COSTS
A) Punch press	<input type="checkbox"/>	X			
B) Shear	X	<input type="checkbox"/>			
C) Milling machine	X	<input type="checkbox"/>	Bridgeport	1	

3.5 HOLE PREPARATION (DESMEAR)	YES	NO	EQUIPMENT	QTY	EQUIPMENT COSTS
A) Permagnate	X	<input type="checkbox"/>		1	
B) Plasma	X	<input type="checkbox"/>	Plasm-Etch	1	
C) Mechanical	<input type="checkbox"/>	X			
D) Etchback	X	<input type="checkbox"/>	Plasma -Etch		

3.6 PRIMARY IMAGE APPLICATION	YES	NO	EQUIPMENT	QTY	EQUIPMENT COSTS
A) Dry film	x	<input type="checkbox"/>	Haukuto; DuPont ASL	3	
B) Hand screening	x		S/M & legend	2	
C) Machine screening	x		Sveca - S/M & legend	1	
D) Wet film	x				
E) Liquid photoimageable	x		Circuit Automation - S/M DP 1500	1	

3.7 TYPE OF TREATMENT FOR MULTILAYER INNERLAYERS	YES	NO	EQUIPMENT	QTY	EQUIPMENT COSTS
A) Black oxide	<input type="checkbox"/>	<input type="checkbox"/>			
B) Red oxide	<input type="checkbox"/>	<input type="checkbox"/>			
C) Copper scrub	x	<input type="checkbox"/>	Schmid - Jet Pumice Scubber	1	
D) Durabond	<input type="checkbox"/>	<input type="checkbox"/>			
E) Alternative oxide	X	<input type="checkbox"/>	Horiozontal MacDermid	1	

3.8 LAMINATION	YES	NO	EQUIPMENT	QTY	EQUIPMENT LINKS
A) High pressure	X	<input type="checkbox"/>	Accudyne 6 opening opening	1	
B) High temperature	X	<input type="checkbox"/>	Accudyne		
C) Vacuum	X	<input type="checkbox"/>	Accudyne	1	
D) Vacuum assist		<input type="checkbox"/>	PHI		
E) Foil heat assist	X	<input type="checkbox"/>	Accudyne		
F) Separate cool-down	X	<input type="checkbox"/>	Accudyne	1	

3.9 ELECTROLESS COPPER PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LINKS
A) Fully additive application	X	<input type="checkbox"/>	ME Baker Programmable Automated Hoist	1	
B) Electroless deposition (semiadditive)		x			
C) Through-hole and via	X	<input type="checkbox"/>	ME Baker Automated		

3.10 COPPER ELECTROPLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LINKS
A) Copper sulfate	X	<input type="checkbox"/>	Manual 1200 gal	3	
B) Pyrophosphate	<input type="checkbox"/>	X			
C) Copper fluoborate	<input type="checkbox"/>	X			
D) Other		<input type="checkbox"/>			

3.11 TIN/LEAD SURFACE PLATINGS/COATINGS	YES	NO	EQUIPMENT	QTY	EQUIPMENT LINKS
A) Tin/lead electroplated	x		1000 gal. Electro-plated Pure Tin	1	
B) Immersion tin or tin/lead (electroless)	x				Out-Sourced
C) Hot air solder leveled (HASL)	X	<input type="checkbox"/>	Argus HASL Vertical	1	

3.12 FUSING PROCESSES	YES	NO	EQUIPMENT	QTY	EQUIPMENT QNTYS
A) I.R. reflow	<input type="checkbox"/>	X			
B) Hot oil reflow	X	<input type="checkbox"/>		1	
C) Horizontal (hot air level)	<input type="checkbox"/>	X			
D) Vertical (hot air level)	X	<input type="checkbox"/>	Argus	1	

3.13 NICKEL SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT QNTYS
A) Electroless nickel	X	<input type="checkbox"/>		1	
B) Electroplated nickel	X	<input type="checkbox"/>			Out-Sourced

3.14 GOLD SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT QNTYS
A) Electroless gold	X	<input type="checkbox"/>		1	
B) Electroplated gold	X	<input type="checkbox"/>			Out-Sourced Full panel - Tabs Internal

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

3.16 SOLDERMASK	YES	NO	EQUIPMENT	QTY	EQUIPMENT QNTYS
A) Screened deposited image	X	<input type="checkbox"/>		1	
B) Dry film photoimageable	X	<input type="checkbox"/>	Dynachem - Conformask	1	
C) Liquid photoimageable	X	<input type="checkbox"/>	Circuit Automation DP 1500	1	
D) Dry film/liquid combination	X	<input type="checkbox"/>			

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

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<b>3.18 MICROSECTION CAPABILITY</b>	<b>YES</b>	<b>NO</b>	<b>EQUIPMENT</b>	<b>QTY</b>	<b>EQUIPMENT QNTY</b>
A) Manual	X	<input type="checkbox"/>	Buehler	1	
B) Single cavity automated	X	<input type="checkbox"/>	Buhler	1	
C) Multiple cavity automated	X	<input type="checkbox"/>	Buehler	1	
D) Plating thickness analysis	X	<input type="checkbox"/>	Nikon Micro-scope – Fisher X-Ray	1	

<b>3.19 CHEMICAL ANALYSIS</b>	<b>YES</b>	<b>NO</b>	<b>EQUIPMENT</b>	<b>QTY</b>	<b>EQUIPMENT QNTY</b>
A) Etching chemistry	<input type="checkbox"/>	x			
B) Plating chemistry	x	<input type="checkbox"/>	Hull Cell – CVS-		
C) Effluent (PPM) analysis	x	<input type="checkbox"/>	AA		

<b>3.20 ELECTRICAL TEST EQUIPMENT</b>	<b>YES</b>	<b>NO</b>	<b>EQUIPMENT</b>	<b>QTY</b>	<b>EQUIPMENT QNTY</b>
A) Continuity and shorts	X	<input type="checkbox"/>	TTI - MicroCraft Emma	2	
B) Fixture development	X	<input type="checkbox"/>	Barco	1	
C) Flying probe test	X	<input type="checkbox"/>	MicroCraft Emma	2	
D) Impedance control	X	<input type="checkbox"/>	Polar	1	