

[illegible]

**FLEXIBLE AND RIDGID FLEX MATERIALS:**

Dupont Copper Clad:

Pyralux AP, AC, AX, FR, LF

Medium Stock

Dupont Bond Ply & Cover Lay:

Pyralux FR, LF, LG, PC

Medium Stock

**Surface Finishes**

Tin-Lead Reflow

Hot Air Solder Level (HASL)

Organic Surface Protectant (OSP)

Wire Bondable Soft Gold (over Nickel)

Hard Gold (over Nickel)

Electroless Nickel Immersion Gold (ENIG)

Immersion Tin

Immersion Silver

Rhodium (outside service)

Electroless Nickel Palladium Gold

Selective Solder

Bare Copper

Lead Free Hot Air Solder Level (outside service)

Mixed Finishes (Subject to Engineering Review)

**Lead Times:**

2 layer	24 hours – 6 weeks
4 - 12 layer	48 hours – 6 weeks
14 – 20 layer	3 day – 6 weeks
22+	5 day – 6 weeks

Build-up Technologies:

1 + n + 1	5 days – 6 weeks
2 + n + 2	7 days – 6 weeks
3 + n + 3	10 days – 6 weeks
4 + n + 4	15 days – 8 weeks

***\*Note: Further build-up technology is subject to Engineering review\****

**Internal Layer Imaging:**

	Standard	Premium	Advanced*
Min Dielectric	.004 +/- .001	.003 +/- .001	.002 +/- .0005
Line W/S (1/2 oz)	.005 +/- .001	.004 +/- .001	.0025 +/- .0005
Line W/S (1 oz)	.006 +/- .001	.005 +/- .001	Engineering Review
Line W/S (2 oz)	.008 +/- .001	.006 +/- .001	Engineering Review
Line W/S (3+ oz)	.010 +/- .002	.009 +/- .002	Engineering Review

**External Layer Imaging:  
(BASE COPPER)**

	Standard	Premium	Advanced*
Max Thickness	.125	.250	Engineering Review
Thickness Tolerance	+/- 10%	+/- 7%	Engineering Review
Line W/S (1/4 oz)	.004 +/- .002	.003 +/- .001	Engineering Review
Line W/S (1/2 oz)	.005 +/- .002	.004 +/- .001	Engineering Review
Line W/S (1 oz)	.006 +/- .002	.005 +/- .001	Engineering Review
Line W/S (2 oz)	.008 +/- .002	.006 +/- .001	Engineering Review

**PTH Capabilities**

*-Subject to change based on material type, board thickness, lamination processes, etc.-*

	Standard	Premium	Advanced*
Min Drill	.010	.008	.006
Min Drill Pad Class 2 (+ drill)	.012	.010	Engineering Review
Min Drill Pad Class 3 (+ drill)	.014	.012	Engineering Review
Min Drill to Conductor	.010	.007	Engineering Review
Min Trace to Drill (laser)	.008	.006	Engineering Review
Max Aspect Ratio (TH drill)	7:1	10:1	Engineering Review
Min Drill laser via	.005	.004	Engineering Review
Min Drill laser via Capture pad	.010	.008	.006
Max Aspect Ratio Blind via	.5:1	.75:1	Engineering Review
Stacked Vias	1	2	3+
HDI Type I	Yes		
HDI Type II		Yes	
HDI Type III			Yes
Sequential Laminations (buried and blind vias)	2 laminations	3 laminations	4+ laminations

PTH Hole Tolerance	+/- .003	+/- .002	Engineering Review
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### Non-Plated Holes

	Standard	Premium	Advanced*
Smallest NP Hole	.012	.010	.008
Largest NP Hole	.287	No Limit	No Limit
Largest Primary Drill NP Hole	.200	.200	.200
NP Hole tolerance	+/- .003	+/- .002	+/- .002
Minimum NP hole to Board Edge	.020	.015	.010

### Back Drilling

	Standard	Premium	Advanced*
Min Back Drilled Hole Diameter	.022	.020	.018
Drilled hole over finished drill size	2x Diameter	.010	.008
Drill Depth Tolerance	+/- .010	+/- .008	+/- .005
Drill Depth to Conductor	.010	.005	.003

*-The proximity of back drills to conductors may affect reliability on various inner-connects within any given design. -*

### Profile / Rout Capabilities

	Standard	Premium	Advanced*
Router Bit Diameter	.062, .093, & .125	.050, .040, .031	.020
Routed Profile tolerance	+/- .005	+/- .004	+/- .003
Minimum Rout Radius	> .031	.016	.010
Cavity Rout	Yes	Yes	Yes
Multilevel Cavity Rout (controlled depth milling)	1 levels	2 levels	3+ levels
Castellated holes (plated edge half holes). Minimum radius	.015	.010	.008

Laser Profile Tolerance	+/- .004	+/- .003	+/- .002
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### Soldermask and Silkscreen

	Standard	Premium	Advanced*
NPTH clearance	.010	.008	.006
SMT clearance	.006	.004	.002
Web between pads	.007	.005	Engineering Review
Masked Defined Pad Diameter	.012	.010	.008
Masked Defined Pad overlap	.005	.003	.0025
Soldermask Type	TAIYO Green	Other colors	Other manufacturers
Dry Film Soldermask			
Minimum Width Silkscreen	.007	.005	.003

### Flexible Coverlay

	Standard	Premium	Advanced*
Coverlay opening	.008 annular ring	.005 annular ring	1:1
Coverlay Web	.010	.008	.006

### Via in Pad / Via Protection

	Standard	Premium	Advanced*
Epoxy/Conductive fill (After Plating)	.012	.010	.008
Epoxy minimum hole	.012	.010	.008
Epoxy maximum hole	.018	.020	.022
Epoxy fill Microvia's		Yes	
Min board thickness	.032	.025	.020
Max board thickness	.125	.150	.200
Via fill aspect ratio	8:1	10:1	12:1
Plated Shut	Yes	Yes	Engineering Review

### Testing / Impedance Capabilities

	Standard	Premium	Advanced*
Min Continuity Resistance	10 ohms	10 ohms	2 ohms
Max Test Voltage	50v	250v	Engineering Review
Max Isolated Resistance	10M ohms	100M ohms	300M ohms
Test Pitch	.019	.010	.007
HiPot	Yes	Yes	Yes
Impedance Tolerance (inner layer)	+/- 15%	+/- 10%	Engineering Review
Impedance Tolerance (outer layer)	+/- 15%	+/- 10%	Engineering Review
Resistor	30%	20%	Engineering Review

### Other Technologies

	Standard	Premium	Advanced*
Screen Printed Silver Chloride Electrodes			Yes
Carbon Ink		Yes	
Screen Printed Resistors			Yes
Etched Resistors (Ohmega Ply)		Yes	
Etched Capacitors (CPly)		Yes	
Heat Sink Bonding		Yes	
Metal Core PCB's		Yes	
Constantan		Yes	
ORMET (701)		Yes	Engineering Review

**DISCLAIMER- All capabilities are subject to change due to material and design technology. Confer with HCI Engineering team PRIOR to RFQ in order to facilitate adequate design rules for a successful/reliable build.**

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