

Fabrication Capabilities

Printed circuit board manufacturing — Toronto, Canada

Quality system	ISO 9001:2015 registered. Certificate Q106008, CWB Registration. Scope: manufacture of printed circuit boards. Valid to August 2029.
Build standard	IPC-6012 Class 3 unless the drawing specifies otherwise. Class confirmed at quotation.
Export control	Registered under the Canadian Controlled Goods Program. Compliant with the Export and Import Permits Act and Export Control List.
Facility	Single site, Toronto, Ontario. Privately owned, operating since 1999.

Standard — routine production, no engineering consultation required. Advanced — regular production capability; confirm at quotation. Achievable — demonstrated capability; discuss with engineering before designing to these values.

Dimensions in inches with metric equivalents. Metric values are converted, not independently toleranced.

Layer count and construction

	Standard	Advanced	Achievable
Layer count — rigid	28	32	40
Layer count — flex	8	12	32
Layer count — rigid-flex	8	22	32
Sequential lamination cycles	3	10	20

Board and panel dimensions

	Standard	Advanced	Achievable
Maximum board thickness	0.060" / 1.52 mm	0.250" / 6.35 mm	0.500" / 12.7 mm
Minimum board thickness (2-layer)	0.005" / 0.13 mm	0.004" / 0.10 mm	0.002" / 0.05 mm
Thinnest core — rigid	0.003" / 76 µm	0.002" / 51 µm	0.002" / 51 µm
Thinnest core — flex	0.002" / 51 µm	0.001" / 25 µm	0.0005" / 13 µm
Thickest core	0.125" / 3.18 mm	0.250" / 6.35 mm	0.400" / 10.16 mm
Largest panel size	18 × 24" / 457 × 610 mm	21 × 24" / 533 × 610 mm	22 × 28" / 559 × 711 mm
Maximum usable area	16.5 × 22.5" / 419 × 572 mm	20.5 × 22.5" / 521 × 572 mm	22 × 34" / 559 × 864 mm
Minimum copper to board edge	0.010" / 254 µm	0.008" / 203 µm	0.003" / 76 µm

Line and space — inner layers

By base copper weight. Plated rows reflect finished copper after plating.

	Standard	Advanced	Achievable
Non-plated trace, ½ oz	0.004" / 102 µm	0.003" / 76 µm	0.001" / 25 µm
Non-plated space, ½ oz	0.004" / 102 µm	0.002" / 51 µm	0.002" / 51 µm
Non-plated trace, ¼ oz	0.003" / 76 µm	0.0025" / 64 µm	0.0008" / 20 µm
Non-plated space, ¼ oz	0.003" / 76 µm	0.002" / 51 µm	0.0008" / 20 µm
Plated trace, ½ oz base	0.0035" / 89 µm	0.003" / 76 µm	0.002" / 51 µm
Plated space, ½ oz base	0.0045" / 114 µm	0.0035" / 89 µm	0.003" / 76 µm
Plated trace, ¼ oz base	0.003" / 76 µm	0.0025" / 64 µm	0.002" / 51 µm
Plated space, ¼ oz base	0.004" / 102 µm	0.003" / 76 µm	0.0025" / 64 µm
Class 2 wrap-plated, min space	0.003" / 76 µm	0.002" / 51 µm	0.002" / 51 µm
Double Class 2 wrap-plated, min space	0.006" / 152 µm	0.005" / 127 µm	0.004" / 102 µm

Class 2 references above are dimensional minimums tied to wrap-plating and pad geometry, not a statement about build class. Boards are built to Class 3 unless specified otherwise.

Line and space by foil metal

Line / space in mils. 1 mil = 25.4 μm . Non-copper foils imaged in house.

Metal	9 μm foil	18 μm foil	35 μm foil	70 μm foil
Copper — standard	5 / 5	5 / 5	5 / 6	5 / 7
Copper — advanced	2 / 2	2 / 3	2 / 5	4 / 6
Brass — standard	5 / 5	5 / 5	5 / 6	5 / 7
Brass — advanced	3 / 5	3 / 6	3 / 5	4 / 6
Constantan — standard	5 / 5	5 / 5	5 / 6	5 / 7
Constantan — advanced	2 / 2	2 / 4	2 / 5	4 / 6
Tin-lead alloy — standard	5 / 5	5 / 5	5 / 6	5 / 7
Tin-lead alloy — advanced	3 / 5	3 / 6	3 / 5	4 / 6
Aluminium — standard	8 / 8	8 / 10	8 / 11	8 / 12
Aluminium — advanced	5 / 5	5 / 9	5 / 10	8 / 11

Drilling and vias

	Standard	Advanced	Achievable
Aspect ratio, 0.010" hole	10:1	15:1	30:1 (thick boards)
Landless aspect ratio	10:1	15:1	20:1
Smallest through via — 0.062" board	0.008" / 0.20 mm	0.006" / 0.15 mm	0.0039" / 0.10 mm
Smallest through via — 0.093" board	0.010" / 0.25 mm	0.006" / 0.15 mm	0.0039" / 0.10 mm
Smallest through via — 0.115" board	0.012" / 0.30 mm	0.008" / 0.20 mm	0.0051" / 0.13 mm
Hole to copper, internal planes	0.010" / 254 μm	0.008" / 203 μm	0.004" / 102 μm
Hole to hole, edge to edge	0.012" / 305 μm	0.007" / 178 μm	0.004" / 102 μm
Press-fit hole tolerance	$\pm 0.003"$	$\pm 0.002"$	$\pm 0.002"$
Back-drill Z-axis tolerance	$\pm 0.006"$	$\pm 0.005"$	$\pm 0.004"$

Aspect ratio by via size: 30:1 on thick boards, 20:1 on 8 mil vias, 18:1 on 4 mil drilled / 2 mil finished. Hole count to 300,000+ per panel.

Microvias and HDI

	Standard	Advanced	Achievable
Laser blind via, rigid	0.006" / 0.15 mm	0.005" / 0.13 mm	0.002" / 0.05 mm
Laser through via, 0.002" flex core	0.005" / 0.13 mm	0.004" / 0.10 mm	0.002" / 0.05 mm
Microvia aspect ratio	1:1	1.2:1	1.5:1
Staggered microvias	Yes	Yes, 10 levels	Yes, 20 levels
Stacked microvias	No	Yes, 2 levels	Yes, 8 levels

Registration and tolerance

	Standard	Advanced	Achievable
Feature-to-feature tolerance	$\pm 0.005"$ / $\pm 127 \mu\text{m}$	$\pm 0.004"$ / $\pm 102 \mu\text{m}$	$\pm 0.003"$ / -0
Layer-to-layer registration	$\pm 0.004"$ / $\pm 102 \mu\text{m}$	$\pm 0.0035"$ / $\pm 89 \mu\text{m}$	$\pm 0.002"$ / $\pm 51 \mu\text{m}$
Plated hole to rigid-flex interface	0.050" / 1.27 mm	0.050" / 1.27 mm	0.030" / 0.76 mm

Bow and twist held to IPC-6012: 0.75% maximum on boards carrying surface-mount components, 1.5% on all others, measured on balanced construction.

Impedance control

	Standard	Advanced	Achievable
Single-ended	±10%	±7%	±2.5%
Edge-coupled differential	±10%	±7%	±2.5%
Broadside differential	±10%	±7%	±2.5%

Via fill and planarization

Capability	
Solid copper filled through vias	Yes — 8, 10 and 20 mil cores
Epoxy filled vias, plated over	Yes
Non-conductive epoxy vias	Yes
Copper paste vias	Yes
Microvias plated solid with copper	Yes
VIPPO — via in pad plated over	Yes
Copper via fields	Yes
Top and bottom planarization after copper fill	Yes
Minimum core thickness with planarization	0.010" / 254 µm
Maximum via dimple depth	0.8 mil / 20 µm
Maximum via protrusion height	0.3 mil / 8 µm

Secondary processes

Process	
Wrap-around edge plating	Yes
Counter bore	Yes
Back drilling	Yes, Z-axis tolerance to ±0.004"
Optical drill, hole to feature	±1 mil / ±25 µm
Mechanical routing tolerance	±2 mil / ±51 µm
Laser routing tolerance	±2 mil / ±51 µm
Metal pullback from substrate edge	2 mil / 51 µm
Ball grid array, including via-in-pad BGA	Yes

Copper coins and thermal

	Standard	Advanced	Achievable
Coin to nearest conductor	0.010" / 254 µm	0.008" / 203 µm	0.005" / 127 µm
Minimum coin thickness	0.059" / 1.50 mm	0.010" / 254 µm	0.008" / 203 µm
Minimum coin size	2 × 2" / 51 × 51 mm	0.5 × 5" / 13 × 127 mm	0.1 × 0.1" / 2.5 × 2.5 mm

Maximum coin thickness is full board thickness. Maximum coin area 16 × 20" / 406 × 508 mm. T-coins available. Also heavy copper to 20 oz, copper-core construction and heat-sink attach.

Soldermask and legend

	Standard	Advanced	Achievable
SMD soldermask web width	0.0035" / 89 µm	0.003" / 76 µm	0.0025" / 64 µm
SMD soldermask annular ring over pad	0.003" / 76 µm	0.0025" / 64 µm	0.002" / 51 µm
Registration tolerance — LDI	0.002" / 51 µm	0.0015" / 38 µm	0.001" / 25 µm
Minimum legend character line width	0.008" / 203 µm	0.007" / 178 µm	0.006" / 152 µm

Board types

	Standard	Advanced	Achievable
Loose-leaf flex	Yes	Yes	Yes
Formed flex	Yes	Yes	Yes
Bookbinder flex	No	Yes	Yes
EMI shielding (Tatsuta)	Yes	Yes	Yes
Backplane	Yes	Yes	Yes
Multichip module	No	Yes	Yes
Heat-sink attach	Yes	Yes	Yes

Surface finishes

Finish	Source
ENIG — electroless nickel / immersion gold	In house
ENIG — thin palladium, <8 µin	In house
ENEPIG — thick palladium, to 24 µin	In house
EPIG — electroless palladium / immersion gold	In house
Immersion silver	In house
Immersion tin	In house
OSP, lead-free compatible	In house
Selective electrolytic wire-bondable soft gold	In house
Selective electrolytic hard gold	In house
Dual gold, thin to thick	In house
HASL, tin-lead and lead-free, vertical	Approved outside source

Eleven of thirteen finishes run in house, which is where the quick-turn schedule comes from — no outbound plating leg.

Materials

Family	Offerings
Standard laminate	FR-4 · halogen-free FR-4 · GETEK · FR-2 (sourced to order)
High-speed digital	Isola I-Tera MT40 · Isola Tachyon · Panasonic Megtron 6 · Megtron 7
RF and microwave	Rogers 3000 / 4000 / 6035-6202 · TMM3 · TMM6 · Taconic TLY · PTFE with fusion bonding
Flexible	Polyimide · Kapton · high-temperature flex coverlay
Metal and thermal	Copper core · aluminium · embedded copper coins · heavy copper to 20 oz
Other substrates	Ceramic
Hybrid	Dissimilar-material stack-ups, including PTFE with FR-4

Lead times

Quick-turn prototype	1–3 business days
Standard production	2–5 business days
Sequential lamination, HDI, rigid-flex	Confirmed at quotation
Transit, Toronto to EU, DHL Express	Typically 3–5 business days door to door

Fabrication time from released data. Layer count and technology drive the schedule; every lead time is confirmed at quotation. Quotes returned within 48 hours.

The processes behind the numbers

Why the specifications above are achievable

Panel plating, then print and etch

The whole manufacturing panel is plated first — hole walls included — and the pattern is imaged and etched afterwards. Most shops run the reverse: image first, then pattern plate. Because the hole is already plated before imaging, it does not need a land to capture it, which is what makes landless vias practical and keeps hole walls reliable at high aspect ratios.

What that gives you

Copper distribution is uniform across the panel, tensile strength holds at 45,000 lb/in² with elongation above 30%, and there is no plating chemistry trapped in the pattern. It is also why impedance results repeat panel to panel rather than drifting between builds.

Induction lamination

Energy goes directly into the resin rather than heating the press. Cure is even across every cycle, so thickness stays consistent through sequential laminations — up to twenty of them. Effectively any PCB material can be laminated, including PTFE fusion bonding and high-temperature flex coverlay.

Picosecond laser ablation

A cold process. Material is removed without heat damage to surrounding structures, allowing clean flex cutting, 2 mil blind vias and clean drilling in PTFE.

Graphite metallisation

A conductive colloid charges the via surface before plating, giving copper-to-copper bonding rather than a chemical interface. Inner-layer junctions hold, so boards last longer in the field.

Key equipment

Twenty production machines. US\$4.86M invested since 2018.

Area	Equipment
Imaging	KLA Nuvogo 600 (2024) · First EIE 500 · Phoenix Turbo (2024)
Lamination	Indubond 360 induction press · DIS pinless induction bonder · IPC brown oxide line
Drilling	Pluritec D6 · Pluritec D2 · 2 × Pluritec Evo router (2025) · Schmoll Pico Flex laser (2024)
Metallisation	Mass via-fill line · MacDermid VF-TH 200 copper fill bath
Soldermask	Microcraft CPQ inkjet, four-head · CMP Forni tack dry oven
Test	ATG A7 flying probe · ATG A5neo flying probe (2023)

Contact

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Send a stack-up and we will confirm within 48 hours whether we can build it, what it costs, and anything in the design worth flagging.