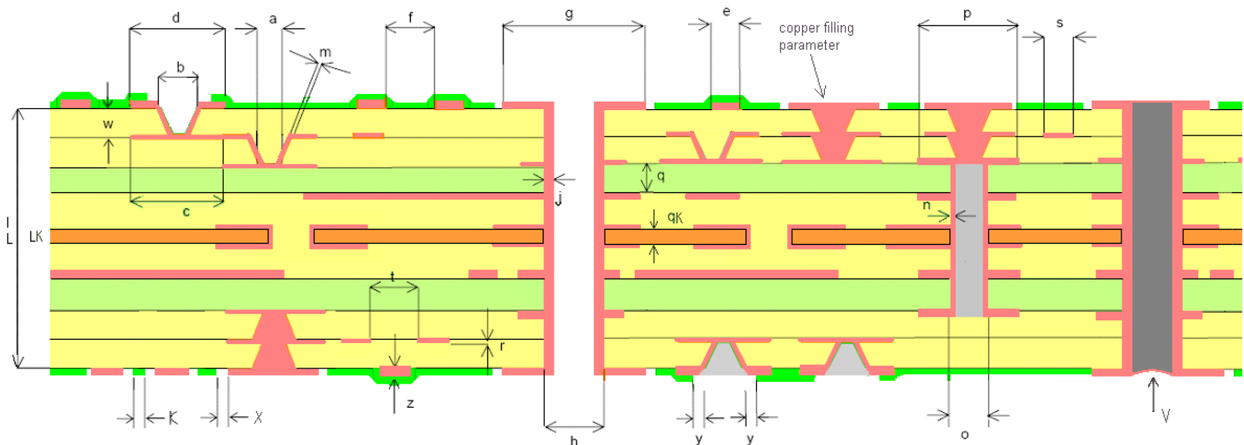
OUR TECHNICAL “ABILITIES”

Technical capabilities chart		Classification								
Item	Description (all relative measures are expressed in mm)	Standard				Advanced			R&D	
		5	6	7	8	9	10	10		
Track & Gap	min Track to Track (TT)/Track to Pad (TP)/Pad to Pad (PP)/Thermal Line Width (TW)	150	125	100	87	87	75	75	60	50
	min Track Width (MTW) / min Thermal Gap (GAP)				87	75	87	75	60	50
Ring Rigid pcb	min Outer Layer Annular Ring (OAR) on Production Hole Diameter (PHD)	150	125	100	100	100	100	100	87	75
	min Inner Layer Annular Ring (IAR) / Thermal Annular Ring on PHD	175	150	150	125	125	100	87	75	75
Hole Diameter	min Production Hole Diameter (PHD) for thickness 1.6 mm (Others: see table)	400	350	300	250	250	200	150	125	100
	max aspect ratio PTH: see also table (Thickness / PHD)	4	5	6	8	10	11	12	14	16
µvia – Burried via	min blind µvia drill diameter - material with glass				150	125	100	75	50	50
	max blind µvia aspect ratio - material with glass (Thickness / PHD)				0.5	0.6	0.7	0.8	1.0	1.0
	min blind µvia drill diameter - material without glass				125	100	87	75	67	50
	max blind µvia aspect ratio - material without glass (Thickness / PHD)				0.55	0.65	0.75	0.85	1.0	1.0
	µvia top pad annular ring				100	75	60	50	50	50
	µvia landing pad annular ring				100	75	60	50	50	50
	µvia holewall distance to cu				200	175	150	150	140	130
	max number of laser runs/side			1	1	1	2	3	4	4
	max number of burried vias			1	1	2	4	6	8	10
Drill /Cu Distance	PTH to cu on inner layers (means IAR + Value)	+75	+75	+75	+75	+75	+75	+68	+60	+50
	NPTH to cu on inner layers /NPTH Routing always>250 µm (means IAR+Value)	+50	+50	+50	+50	+50	+50	+50	+50	+50
	NPTH to cu on outer layers (NPTH Routing always >200 µm)	250	200	200	200	200	150	125	100	75
Cu Thickness	maximum total cu thickness that can be etched (no minimum)	70	50	40	25	20	20	15	15	12
Solder Mask	solder mask annular ring (MAR) & conductor overlap (MOC): typical	80	75	75	75	60	60	50	40	30
	solder mask annular ring (MAR) & conductor overlap (MOC): exceptional			60	60	50	40	30	25	25
	solder mask min segment (MSM) (If Cistelaier creates SM, MSM >= 100)	125	110	100	100	90	90	80	70	60
Build up	max pcb thickness (mm)						>3.2	>3.2	5.00	5.20
	min pcb thickness tollerance (%)	10	10	10	10	10	8	7.5	5	5
	max nr. Layers (for the Flex layer add 1unit in complexity)	12	16	18	20	22	24	26	32	40
Ring ML Flex & Flex-Rigid Flex layers (for rest = 0) should be 100 µm bigger then on rigid boards										



Symbol	Parameter	Value
A/B	Min Vias laser	50 µm
C/D	Min. Anular ring on laser via	>+100 µm
E/F	Min. line/space on base Cu9µm–Outer layer	68 µm
G/P	Min. Anular Ring on Burried hole and PTH	>+150 µm
H/O min	Min. Mech. Plated Through Hole → I value	0.1 mm
H max	Max. Plated Through Hole	unlimited
O max	Max. Plated Burried hole	1.2 mm
I min	Min. core thickness on DS - flex	25 µm
I max	Max. pcb thickness on ML	5.20 mm
L	Max. No. of Layers	40 layers
LK	Max. No. of Flex Layers	12 layers
M	Min. Cu th.ss in laser/blind vias	> 12 µm

Symbol	Parameter	Value
J/N	Min. Cu Th.ss in Burried and Through vias	>20 µm
Q	Min. thickness rigid base material	50 µm
Qk	Min. thickness flexible base material	25 µm
S/T	Min. line/space on base Cu17µm–Inner layer	68 µm
R	Min. Copper Th.ss Inner layer	12 µm
Z	Min. Copper Th.ss Outer layer	9 µm
V	Dimple in resin filled plated Through hole	<18 µm
W	Min. prepreg core thickness	50 µm
Y	Min. Solder mask Opening on vias	100 µm
K	Minimum Solder mask dam	75 µm
X	Min. solder mask clearance	50 µm
Cu Filling	Prefered Design parameter for Cu filling	W=75µm /B=90µm

OUR TECHNICAL "ABILITIES"

TECHNICAL DETAILS

- **Plated Through Hole:** minimum finished diameter 150 µm - Aspect Ratio for PTH: ≤ 12
- **Blind Microvia:** minimum drilled diameter 60 µm (laser drilled) - Aspect Ratio for blind vias: ≤ 1
- **µVias treatment:** Copper filled blind vias and Capped blind vias
- **Vias treatment:** Capped through vias with TAIYO THP-100DX1, Prepreg EMC 827I or Ventec VT901 or Arlon 85N
- **Fine line:** minimum track/spacing is 50 µm, ±10 tolerance with 9 µm copper
- **Layer count:** standard up to 32, special requirement over this value after DFM evaluation
- **Flexible Layer count:** up to 6 inner layer in a Rigid-Flex build up, special requirement over this value after DFM evaluation
- **Sequential lamination:** up to 3+N+3 (SBU) , special requirement over this value after DFM evaluation
- **Cu thickness on layer:** Thin copper 5 µm; 9 µm; 12 µm, from 17 µm, 35 µm, 70 µm, 105 µm and heaviest up to 500 µm,special requirement over this value or selective thickness on same layer after DFM evaluation
- **Cu thickness on vias:** IPC class 2, class 3 and 3DS as standard, special requirement like plating up to 100 µm for power and heat management, also selectively, can be performed
- **Minimum Inner layer thickness:** 50 µm, special requirement after DFM evaluation
- **Minimum Prepreg thickness:** 50 µm (1 x PP106) or lower but after DFM evaluation (PP1027 or PP1037)
- **Minimum Flexible layer thickness (Adhesive less):** 50-75-100-125-150 µm as standard, lower and higher thickness as special requirement
- **Maximum PCB thickness:** 5.5 mm
- **Maximum PCB dimensions:** Standard: 464 x 566 mm, up to 855 x 464 mm after DFM evaluation
- **Solder Mask:** curtain coated (Green), spray coated or screen printed (special and colored)
- **Solder Mask capability:** Solder Dam 100 µm standard and 70 µm special; Clearance down to 20 µm and solder mask land definition
- **Vias Treatment:** All process like per IPC4761 classification
- **Printing application:** legend, Peelable mask, graphite and resistive inks and serialization (numbering, 2D barcode, QR Code, Datamatrix, standard barcode)
- **Finishing:** Hasl with/without Lead; Enig (Al bondable); Immersion Tin & Silver; ENIPIG (Au bondable); Galvanic hard and soft gold, tin-lead hot oil reflow
- **Heat dissipator:** Aluminum & Copper Heat Sink, printed heat sink with Peters HSP2741 resin
- **Heat dissipation & Power management techniques:** copper inlay and copper coin techniques (Pressfit, Embedded and post bonded)

BASE MATERIALS FOR PCBs

Standard FR4, high Tg Laminates also Halogen Free and specific for High Speed Digital:

- FR4 standard & Leadfree: Iteq IT140 & IT588; Isola Duraver ML104i - Tg 140 °C; Black FR4
- Mid Tg epoxy for Lead-free process: Iteq IT158 -Tg 160 °C ; Isola IS400 -Tg 150 °C
- Mid Tg– Halogen Free: Iteq IT40G -Tg 140 °C, IT150G;
- High Tg 180°C epoxy (without filler): Iteq IT180 (also No/Low flow Prepreg); Isola IS420& IS410; ARLON 45N
- High Tg 180°C epoxy (with filler): Iteq IT180A & IT180i; Isola PCL370HR; Nelco N4000-29 ; Hitachi 700GR; EMC 827 i
- High Tg 170°C epoxy – Halogen Free: Iteq IT170GRA1 & IT170G & IT180GN
- High speed application: Nelco N4000-13(Si) & N4800-20(Si); Isola Fr408HR, IS600 (series), I-Tera, Tachyon and Astra; Iteq IT200DK and IT150DA(SE), IT-968 (SE), IT-968G, IT-988G, IT-988G SE; Panasonic Megtron6 and Megtron7
- Capacitance layer: OAK-Mitsui Faradflex

High-performances materials for avionic/military application:

- Polyimide Resin System: Arlon 33N, 35N, 84N, 85N, 85HP; Ventec VT901(also No/Low flow); Hitachi MCL-I-671; Isola 95P/96P; NELTEC N 7000VO
- Epoxy Resin System: Arlon® Kevlar 4NK (Tg 170 °C and 4.7 ppm/°C)
- Epoxy and Polyimide Thermount® & Para Aramid fiber: ARLON® 55NT/85NT
- Copper/Invar/Copper : tipically 150 µm thick - 17/120/17 µm)
- Thick copper: up to 500 microns and over, for BusBar application and copper inlay&coin technology

Substrates for flexible circuits:

- Flexible Laminates-Polyimide film based: DuPont PYRALUX LF; PYRALUX FR;
- Flexible Laminates- Polyimide film based Adhesiveless: PYRALUX AP, PYRALUX AP-Plus & PYRALUX TK
- Flexible Laminates-Polyimide based Adhesiveless: UBE Upilex 25-50-75 µm; Iteq 25-50-75-100 µm; Panasonic 25-50-75-100-125-150 µm; ThinFlex 25-50-75-100-125-150 µm
- Emi shielding layer: Tatsuta SF-PC6000 and TATSUTA SF-PC 3300

High Frequency materials Teflon® based and non-Teflon based:

- Rogers® / Arlon(also Copper/Brass supported): RT/Duroid Family ; RO3000 Family; TMM Family; DiClad Family; Isoclad Family; Cuclad Family; AD Family; AR Family; TC Family
- Rogers® / Arlon®: RO4350 & RO4003 (Back up material for discontinued 25N & 25FR but partially applicable), RO4360G2 and RO4400 bondply
- Iteq "new generation" material for RF and Microvawe applications IT-88GMW, IT-8300GA, IT-8338G, IT-8338A, IT-8350G, IT-8350A, IT-8615G with Dk from 3,00 up to 6,15 (6,05)
- Isola: IS600(Series), Astra MT77, I-tera and TerraGreen
- Taconic®: RF25A2, RF35, RF35A2, RF45, RF60, TSM-DS3, Cer10, FastRise, TACLAM Plus and all teflon family (TLX, TLY, TLE)
- Nelco: Mercurywave series, Meteorwave (1000 & 4000 Series) and all teflon family
- Foam: Rohacel HF51