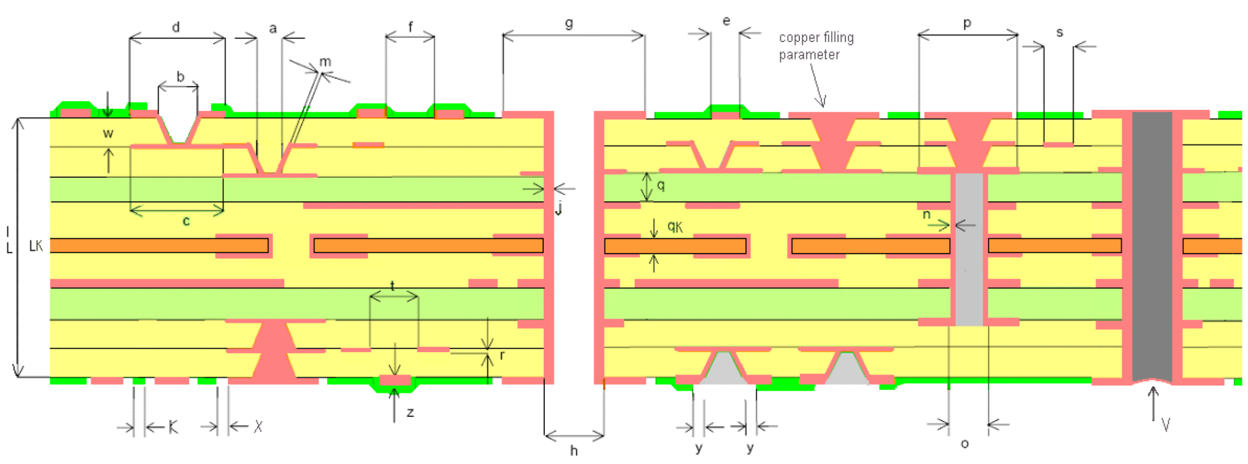
OUR TECHNICAL “ABILITIES”

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	
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 layers;										



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 à l 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	Design parameter for best copper filling	W=75μm /B=90μm

TECHNICAL DETAILS

- **Plated Through Hole:** minimum finished diameter 150 µm - Aspect Ratio for PTH: ≤ 12
- **Blind Microvia:** minimum diameter 75 µm (laser drilled) - Aspect Ratio for blind vias: ≤ 1
- **µVias treatment:** Capped through vias and Copper filled blind vias
- **Fine line:** minimum track/spacing is 50 µm, ±10% tolerance with 9 µm copper
- **Layer count:** standard up to 32, special requirement after DFM evaluation
- **Flexible Layer count:** up to 6 inner layer in a Rigid-Flex build up, special requirement after DFM evaluation
- **Sequential lamination:** up to 3+N+3 (SBU) , special requirement after DFM evaluation
- **Cu thickness:** Thin copper 5µm; 9µm; 12µm, from 17µm, 35 µm, 70µm, 105µm and heaviest up to 500um
- **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 Kapton thickness (Adhesive less):** 50 µm, 25 µm special requirement
- **Maximum PCB thickness:** 5.5 mm
- **Maximum PCB dimensions:**
- - **Multiline:** 464x566 mm
- - **Riveted :** it is possible to handle boards up to 855x464 mm after DFM evaluation
- **Solder Mask:** curtain coated (Green) or screen printed (special and colored)
- **Solder Mask capability:** Solder Dam 100µm standard and 70µm special; Clearance down to 40µm
- **Vias Treatment:** tenting and plugging process like per IPC classification
- **Printing application:** legend, Peelable mask, graphite and resistive inks
- **Finishing:** Hasl with/without Lead; Enig (Al bondable); Chem. Tin &Ag; ENIPIG (Au bondable); Galvanic hard and soft gold
- **Heat Dissipator:** Aluminum, Copper or printed with Peters HSP2741

BASE MATERIALS FOR PCBs

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

- FR4 standard: Iteq IT140; Isola Duraver ML104i - Tg 140 °C
- Mid Tg epoxy for Lead-free process: Iteq IT158 -Tg 160 °C
- Mid Tg epoxy for Lead-free process – Halogen Free: Iteq IT40G -Tg 140 °C (also Noflow Prepreg) , IT150G (also Noflow Prepreg);
- High Tg 180°C epoxy (without filler): Iteq IT180 (also No/Low flow Prepreg); Isola IS420; ARLON 45N
- High Tg 180°C epoxy (with filler): Iteq IT180A; Isola PCL370HR; Nelco N4000-29 ; Hitachi 700GR
- High Tg 170°C epoxy – Halogen Free: Iteq IT170GRA
- High speed application: Nelco N4000-13 & N4800-20; Isola Fr408HR and I-Tera; Iteq IT200DK and IT150DA; Panasonic Megtron6

High-performances materials for avionic/military application:

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

Substrates for flexible circuits:

- Flexible Laminates-Kapton® based: DuPont PYRALUX LF; PYRALUX FR; PYRALUX AP (Adhesiveless)
- Flexible Laminates-Polimide based: UBE Upilex (Adhesiveless); Iteq (Adhesiveless)

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

- Rogers® / Arlon®: Duroid Copper/Brass supported; RO3003;Rt5880; RT6002; TMM10 / AR350; AR600; AR1000;DiClad Family
- Rogers® / Arlon®: RO4350 & RO4003 (Back up material for discontinued 25N & 25FR but partially applicable)
- Rogers® : ULTRALAM® 3850HT - Liquid Crystalline Polymer (LCP)
- Taconic®: RF25A2, TSM-DS3, Cer10, FastRise, TACLAM Plus and all teflon family
- Nelco: Mercurywave series and all teflon family