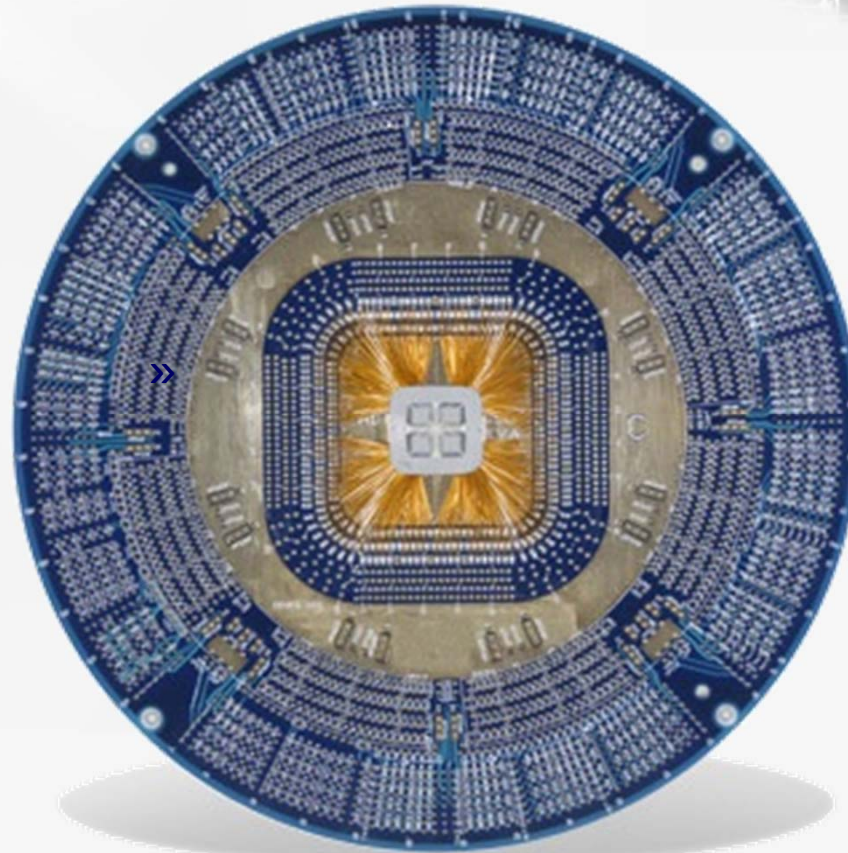


Printplaat Technologie

CYNER
SUBSTRATES



3 november 2012 Apeldoorn

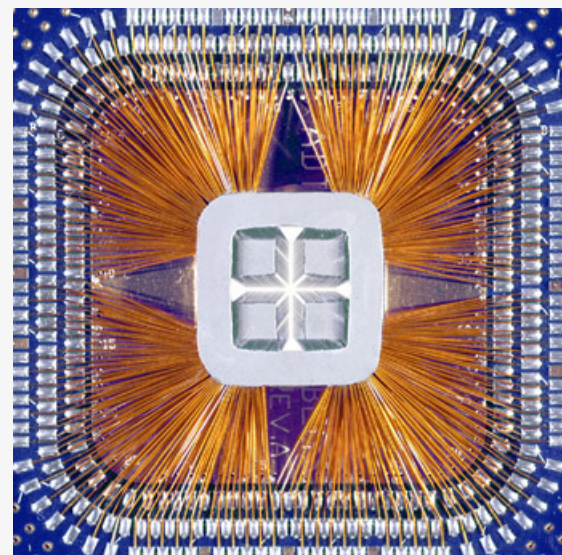


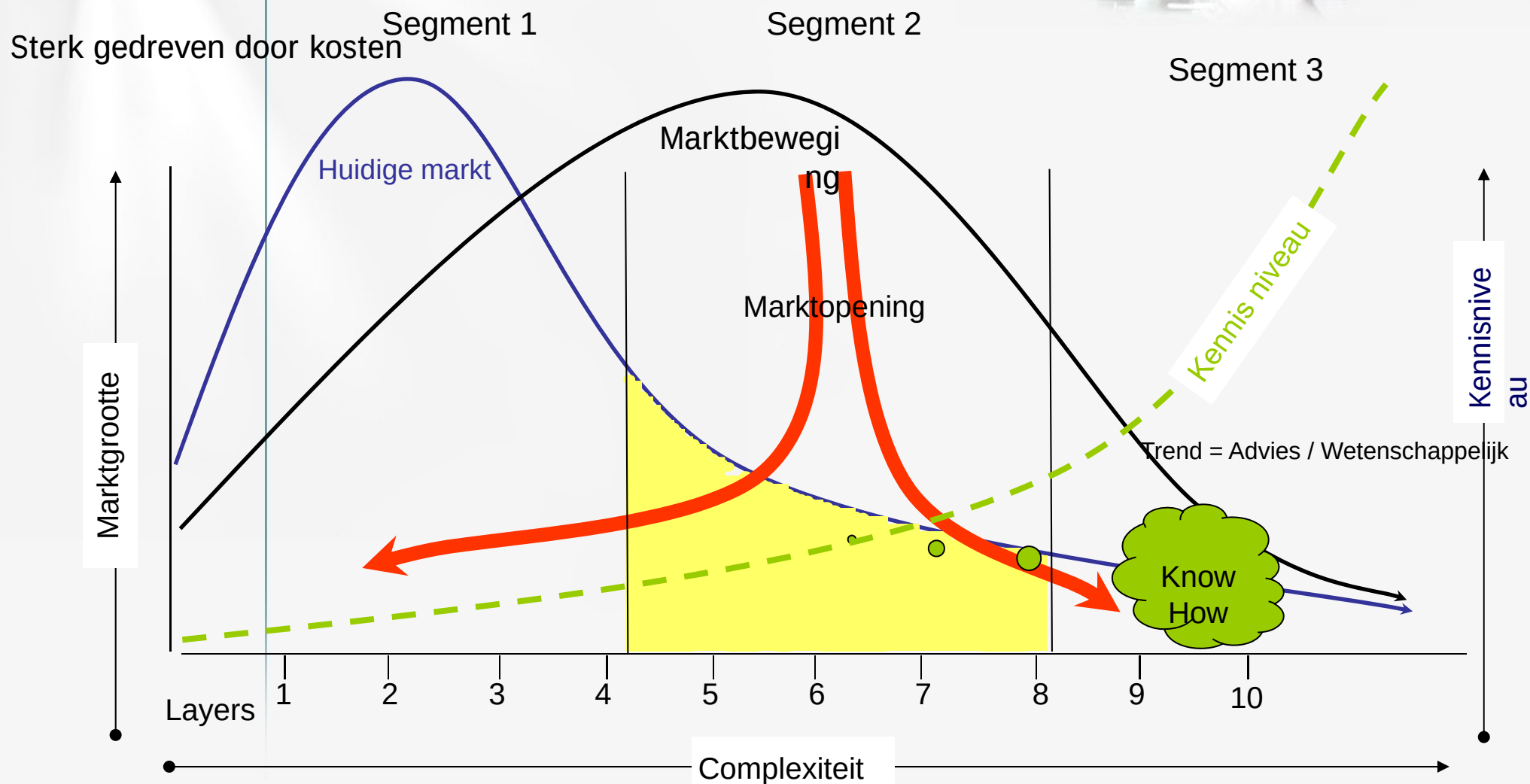
- Levert en produceert printplaten voor de professionele elektronica industrie
- Meer dan 28 jaar PCB (productie-) ervaring
- Fabriek in Utrecht - centraal in Nederland, langs de A2

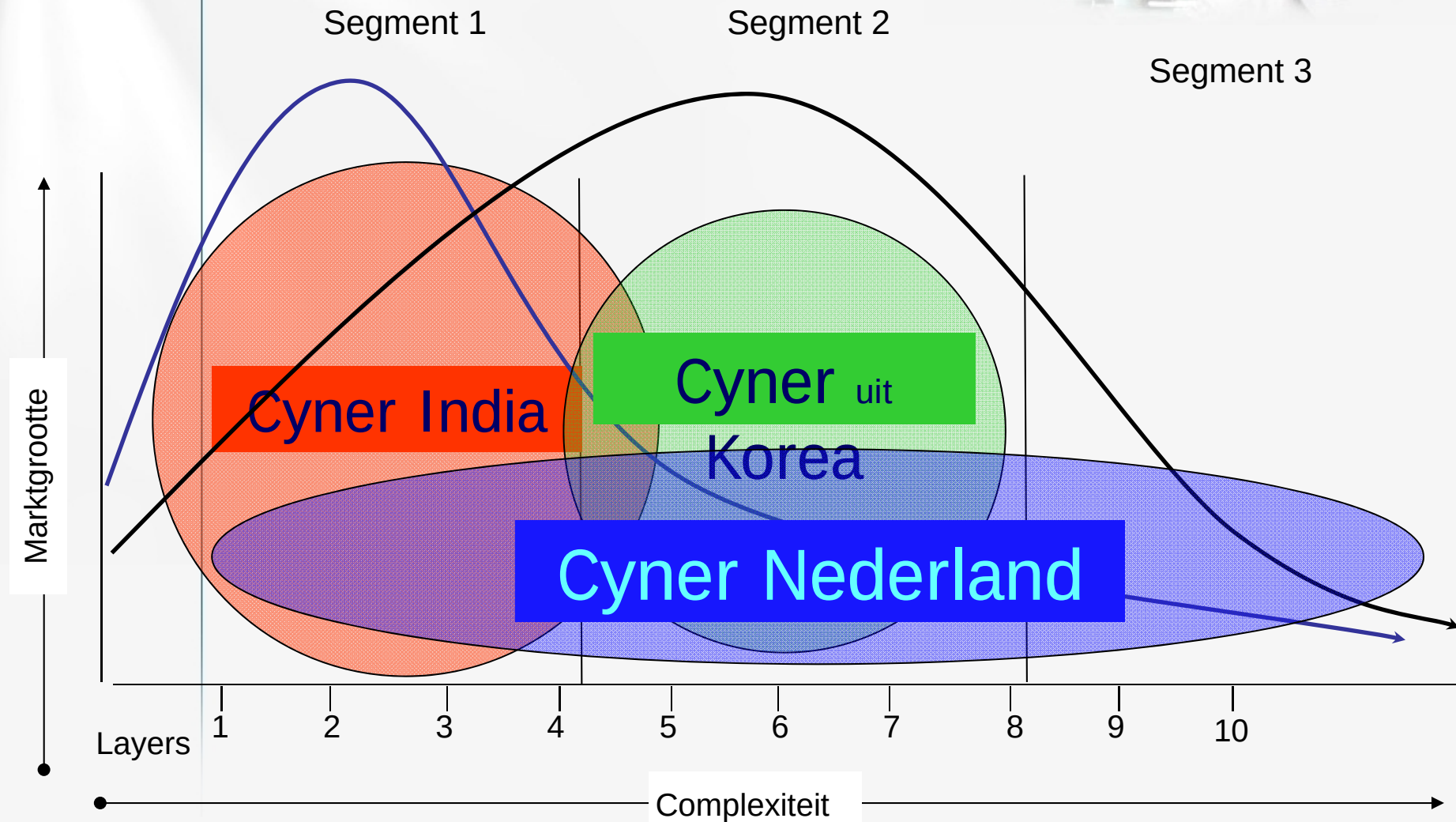


Cyner Substrates B.V.

Savannahweg 60 3542 AW UTRECHT
Postbus 40213 3504 AA UTRECHT
T: 0307 890 900 F: 0307 890 919
E: info@cyner.nl W: www.cyner.nl



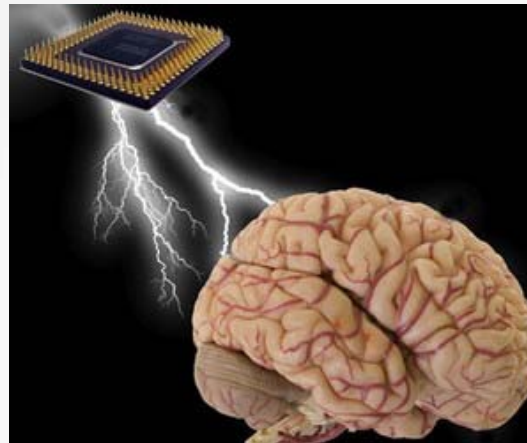
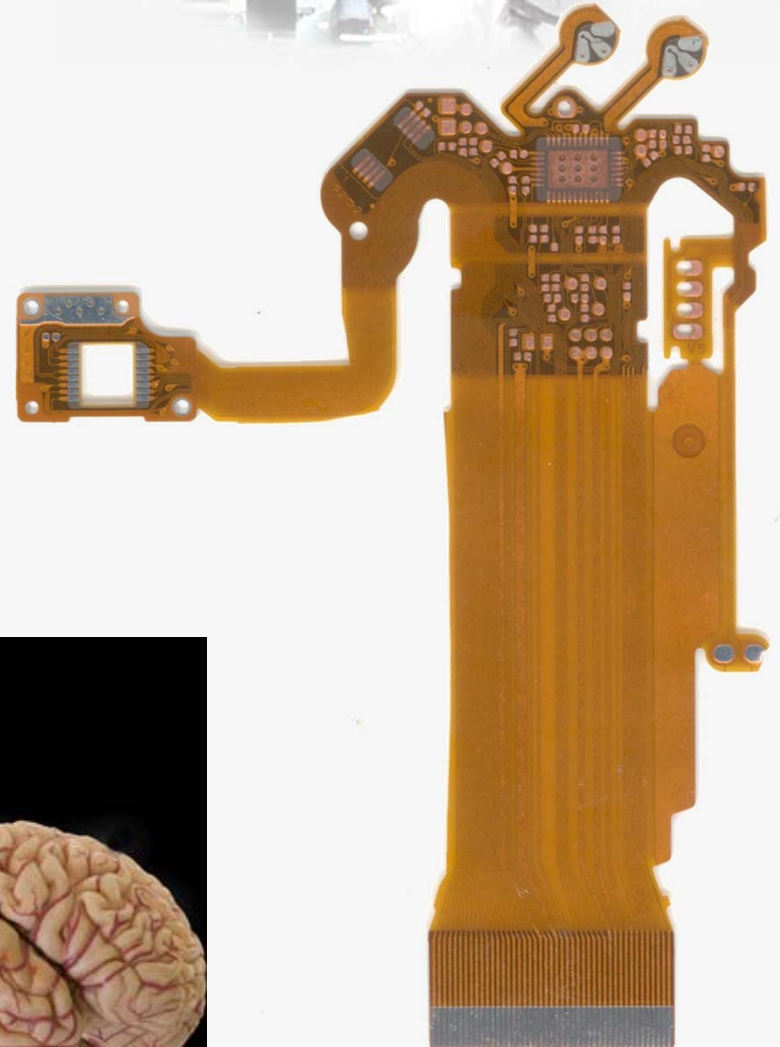




Overzicht

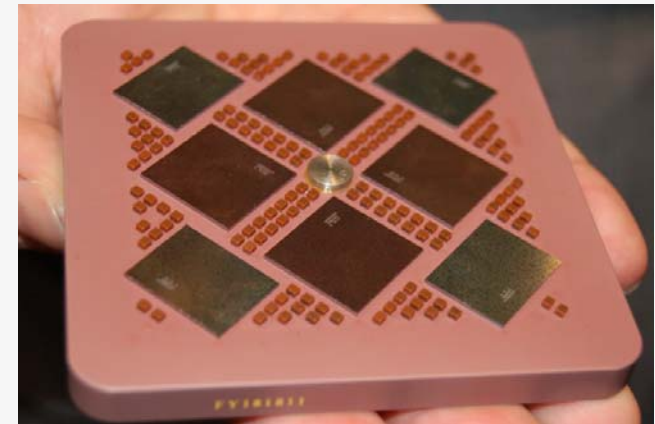
CYNER
SUBSTRATES

- PCB Soorten
- PCB Productieproces
- IPC
- Materiaal Ontwikkelingen
- Innovaties
- Wat staat ons te wachten



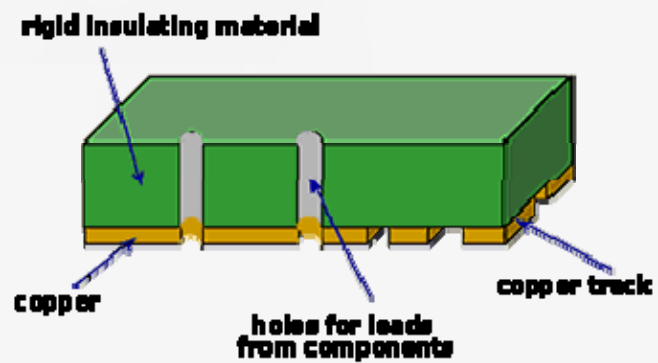
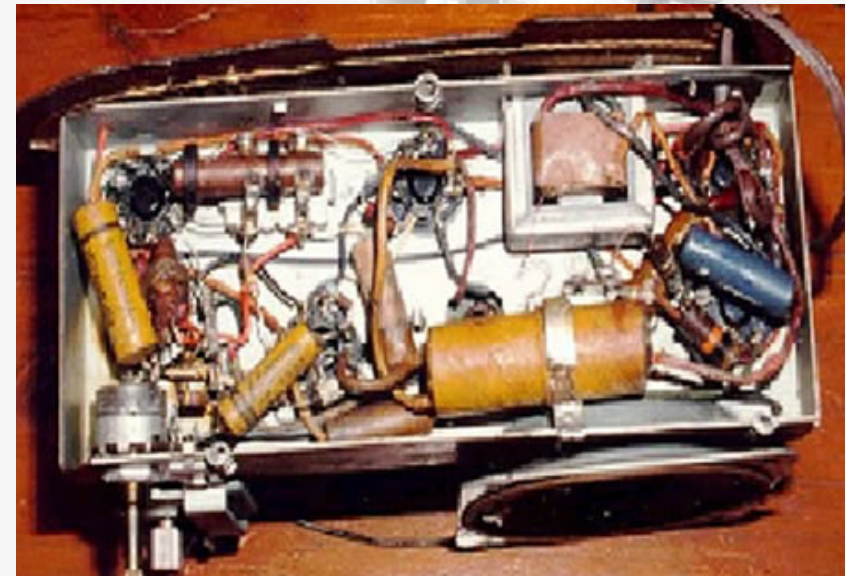
PCB Soorten

- Enkel en Dubbelzijdig
- Multilayer
- Flex
- Flex-rigid
- MCM (Multi chip module)
- HDI (High Definition Infrastructure)
- MCPCB (Metal Core Pcb)
- HF- RF (High Frequency –Radio Frequency)



Single Sided

CYNER
SUBSTRATES



Double sided PCB

Legend

1 thru-hole component

2 mounting hole

3 component hole

4 plated-through hole

5 non-plated-through hole

6 component side

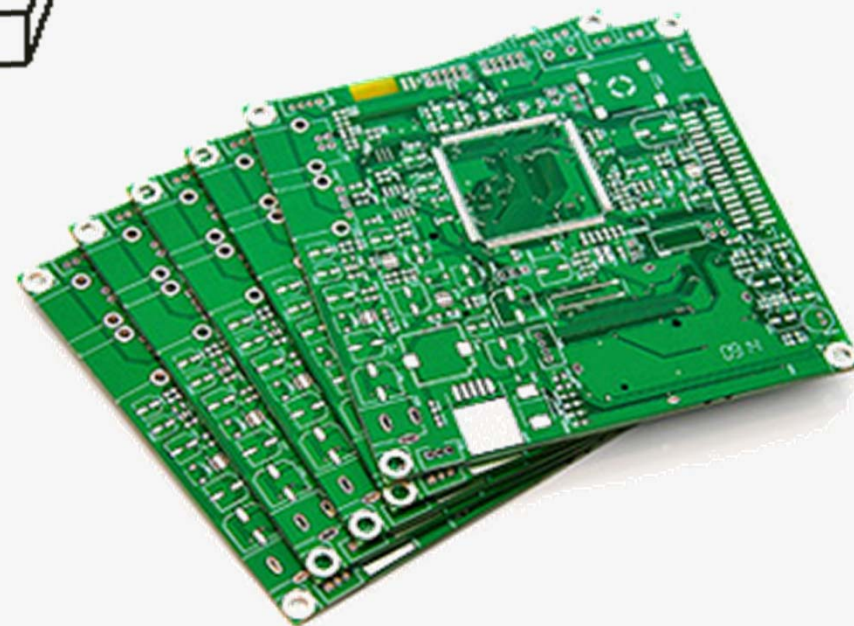
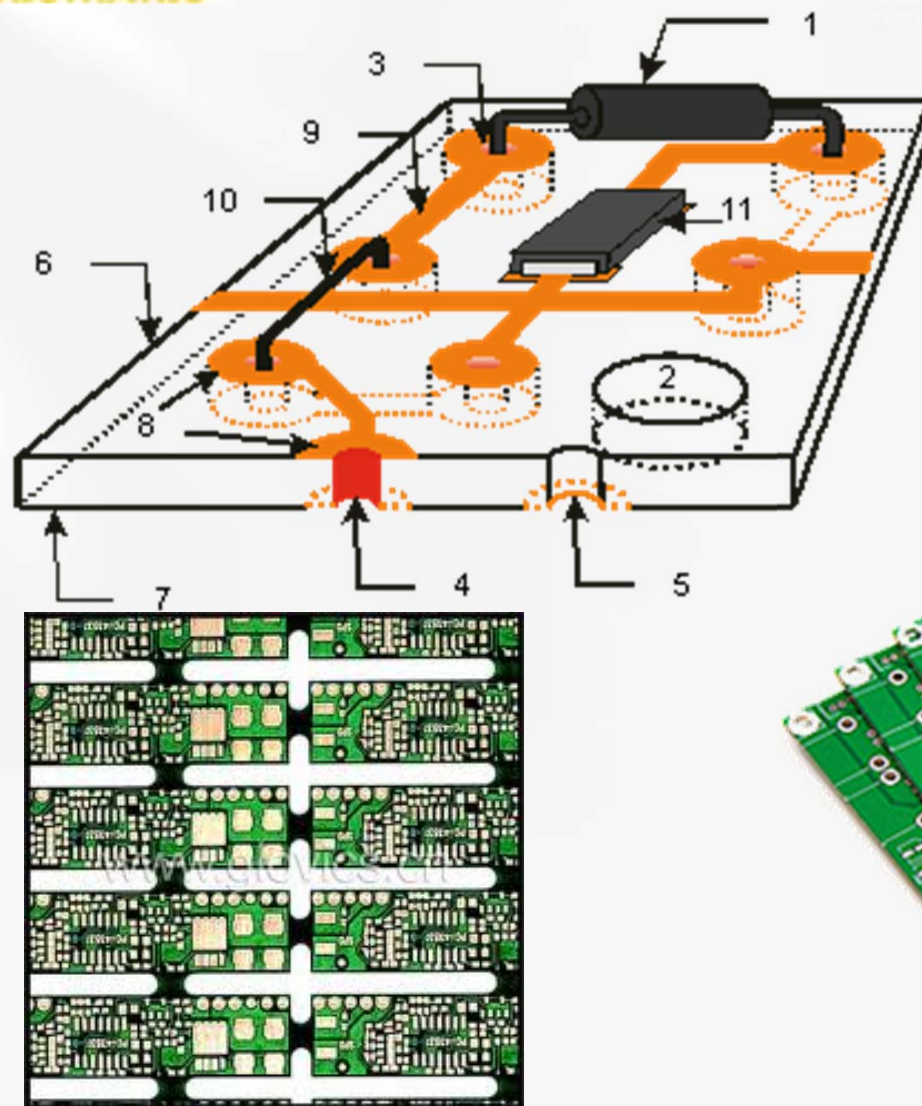
7 soldering side

8 pad

9 conductor

10 jumper

11 surface mounted component

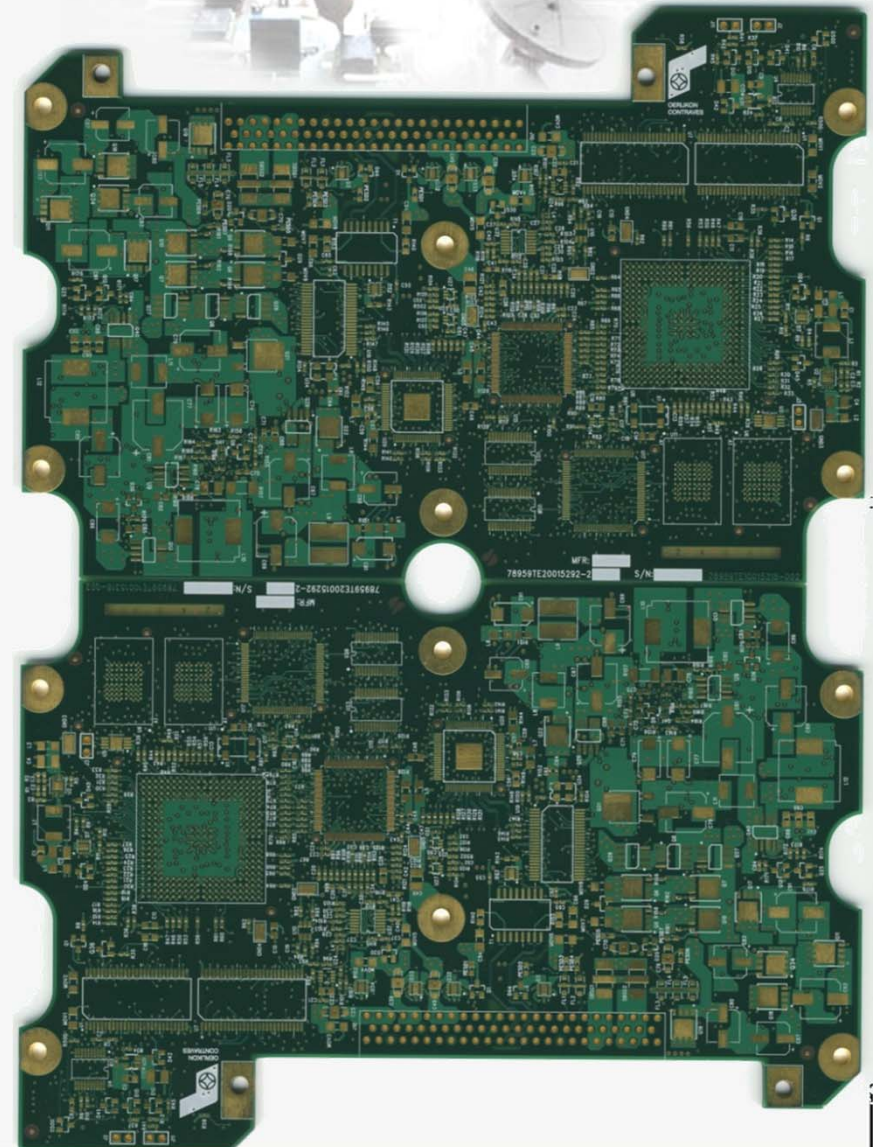


MULTILAYER

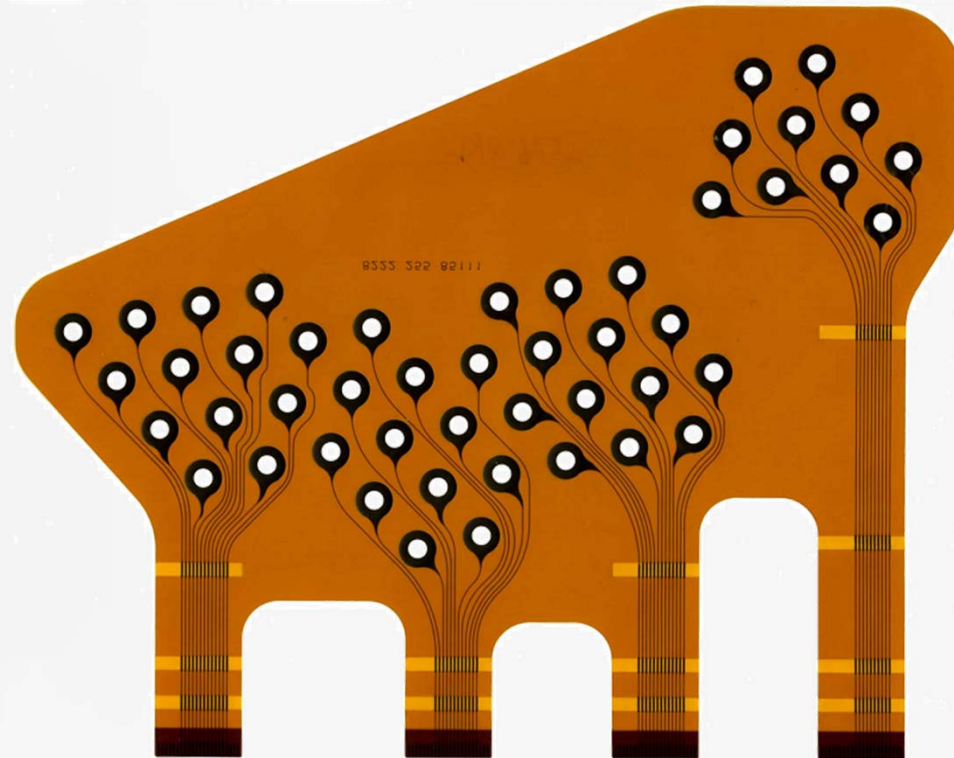
CYNER
SUBSTRATES



Impedance ID	Structure Name	Trace 1 in Layer	Trace 2 in Layer	Ref. Plane 1 in Layer	Ref. Plane 2 in Layer	Lower Trace Width	Upper Trace Width
1	Coated Microstrip 1B	1	0	3	0	0.279	0.229
2	Edge Coupled Coated Microstrip 1B	1	0	3	0	0.203	0.178
3	Offset Stripline 1B1A	4	0	3	6	0.356	0.343
4	Edge Coupled Offset Stripline 1B1A	4	0	3	6	0.254	0.229
5	Embedded Microstrip 1B1A	2	0	3	0	0.102	0.076



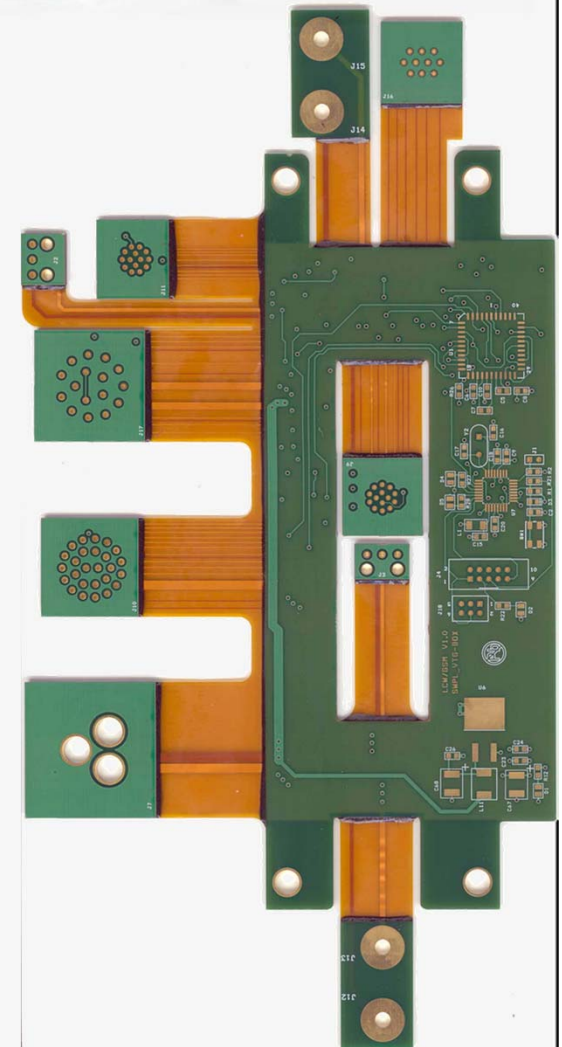
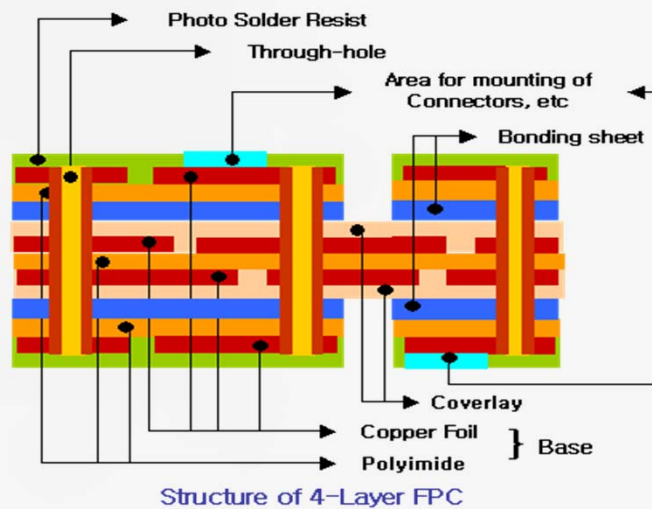
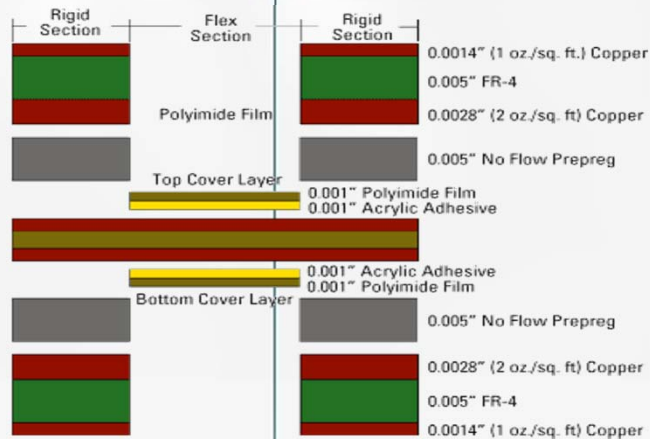
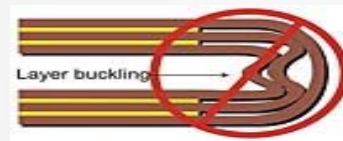
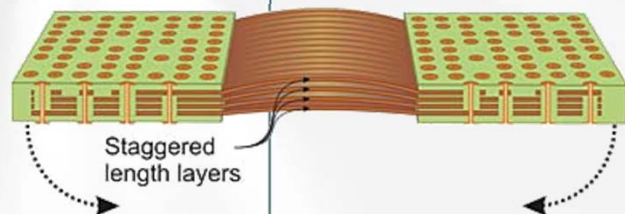
CYNER
SUBSTRATES



Flex-Rigid

CYNER
SUBSTRATES

- Bookbinder en Bikini technologie



High Density Interconnection

CYNER
SUBSTRATES

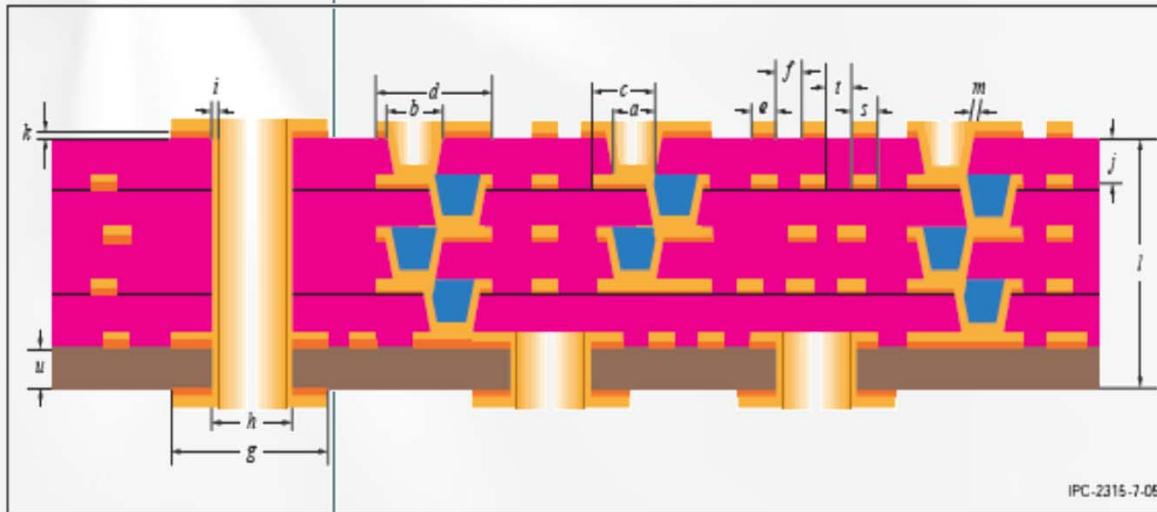
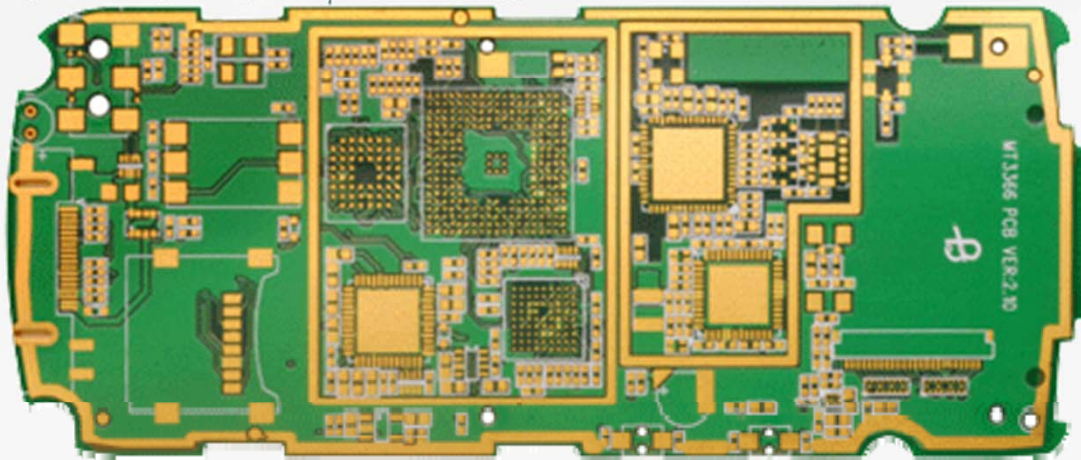


Figure 7-5 Design Example for Type III HDI with Staggered Microvias



MCPCB

CYNER
SUBSTRATES

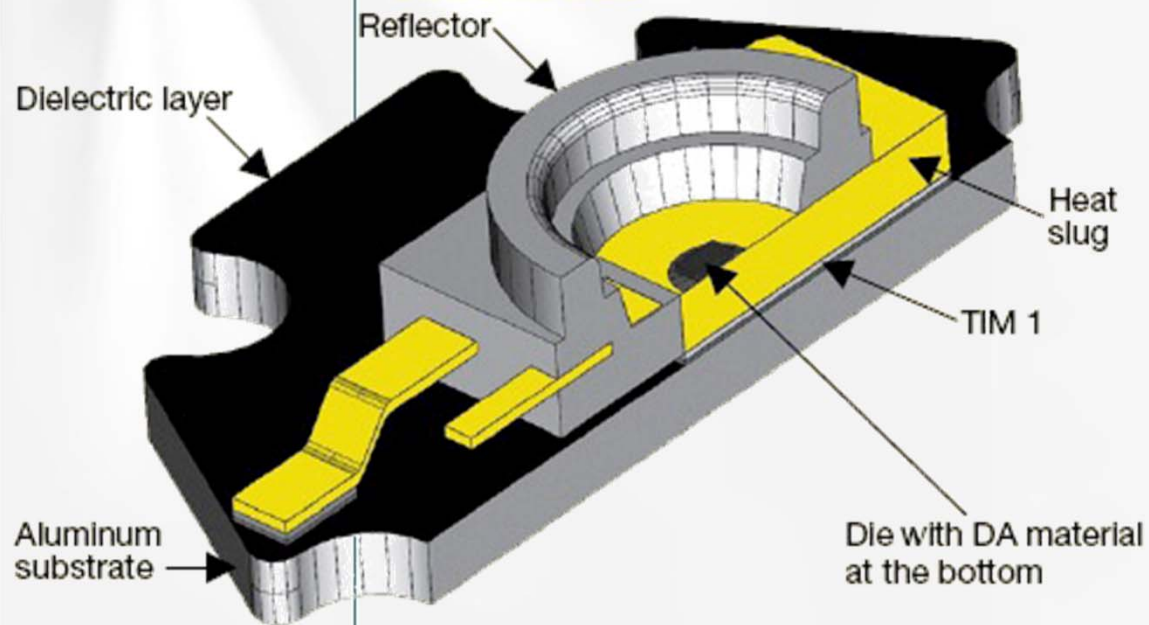
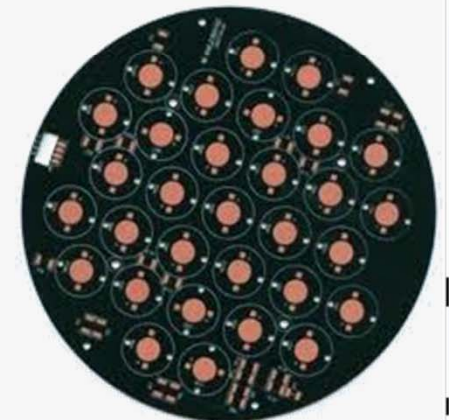
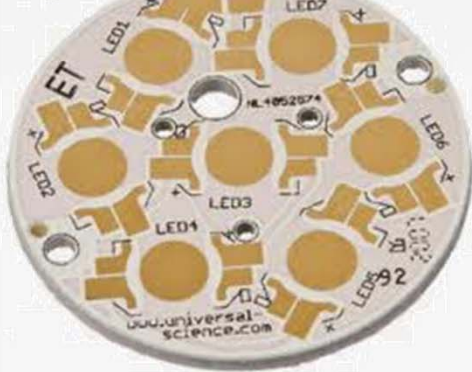
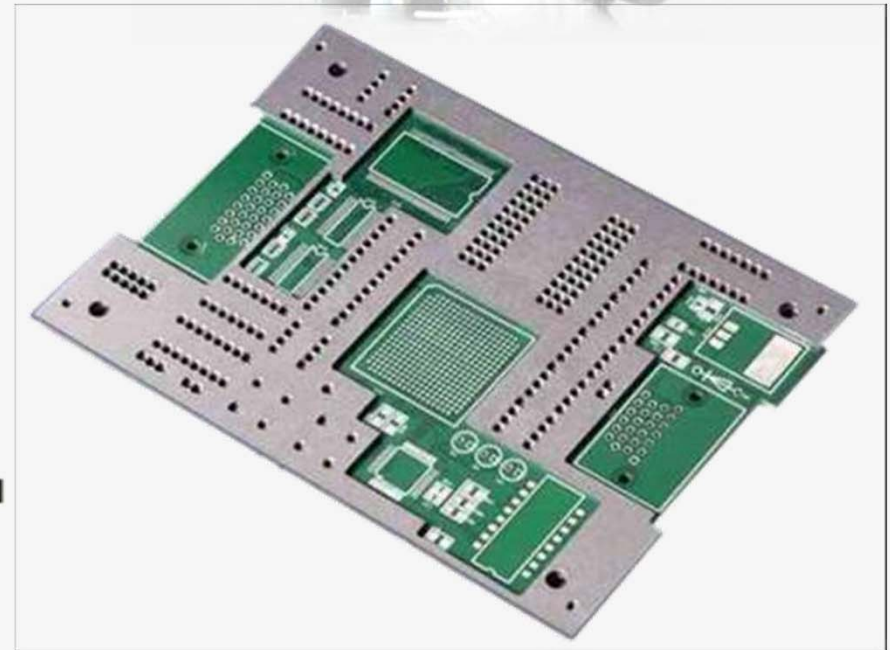
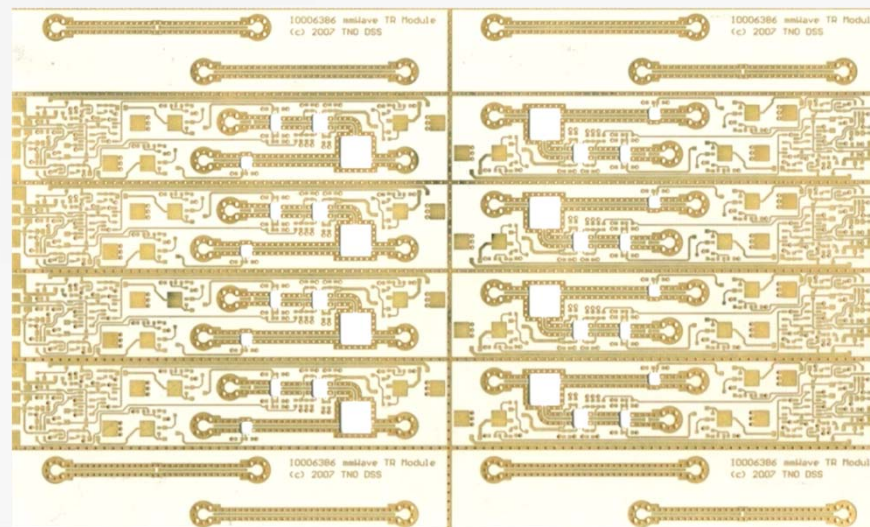
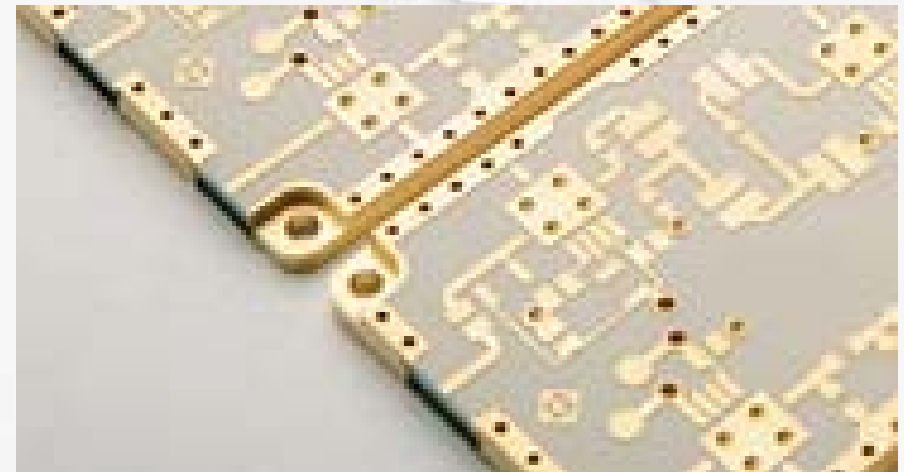
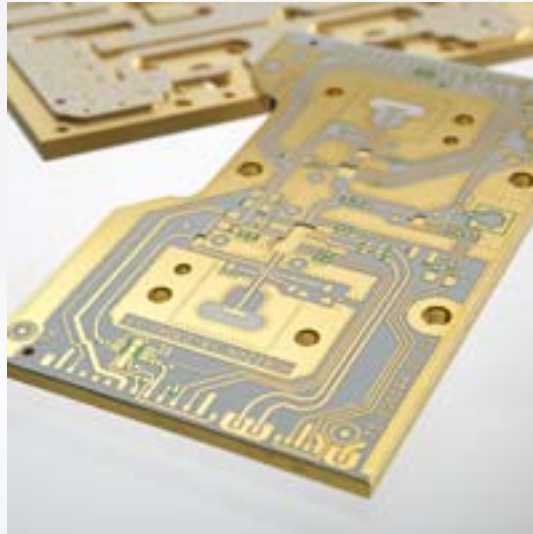


Fig 2a 3D Cross Section of LED Star Package





Wat is Microwave



Microgolf (IEEE US)

Band	Frequentiebereik
L-band	1 tot 2 GHz
S-band	2 tot 4 GHz
C-band	4 tot 8 GHz
X-band	8 tot 12 GHz
K _u -band	12 tot 18 GHz
K-band	18 tot 26 GHz
K _a -band	26 tot 40 GHz
V-band	40 tot 75 GHz
W-band	75 tot 111 GHz

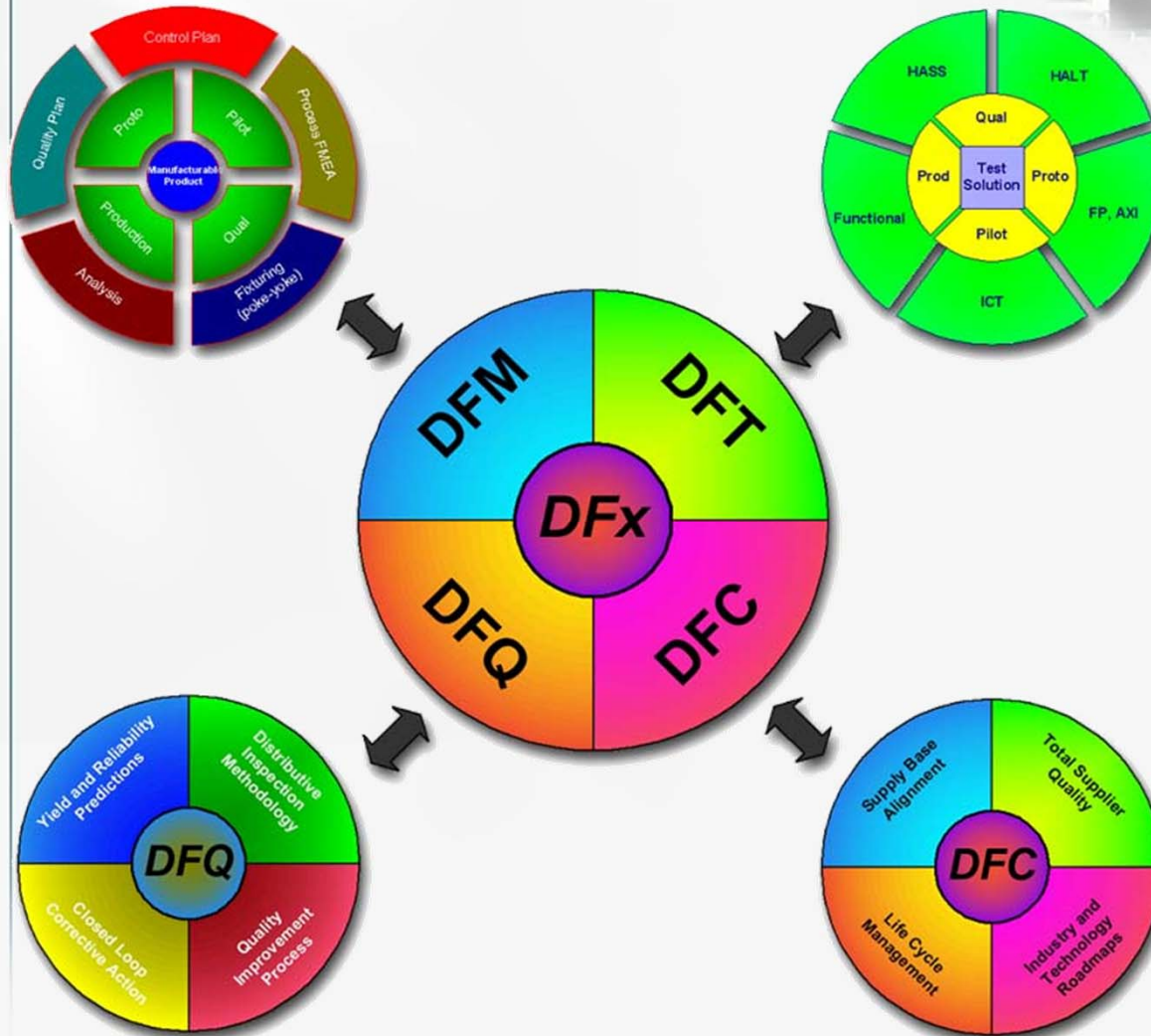
- Microwave PCB,s = Concurrent Engineering
- Concurrent Engineering = DfX
- DfX = Design for Excellence
- Microwave Fr4 of ander materiaal

Radiospectrum

ELF	SLF	ULF	VLF	LF/LW	MF/MW	HF/SW	VHF	UHF	SHF	EHF
3-30Hz	30-300Hz	300Hz-3kHz	3-30kHz	30-300kHz	300kHz-3MHz	3-30MHz	30-300MHz	300MHz-3GHz	3-30GHz	30-300GHz
FR4 DIV.										

Wat is DFX

CYNER
SUBSTRATES



Trends



	2000	2005	2010	2015
Transistor gate length (nm)	130	80	45	25
On-chip clock frequencies (GHz)	1.2	5	15	33
Off-chip frequencies (GHz) High-speed buses	0.7	3	10	29
Equiv. switching edge rate (ps)	455	106	32	11
Supply voltage (V)	1.9	1.1	1.0	0.8

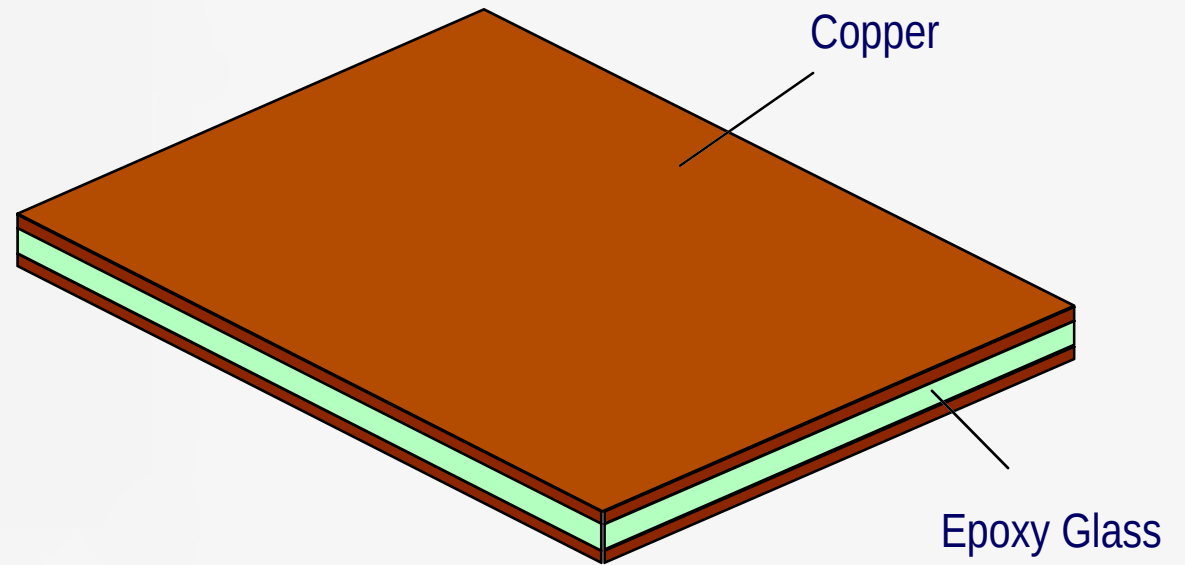
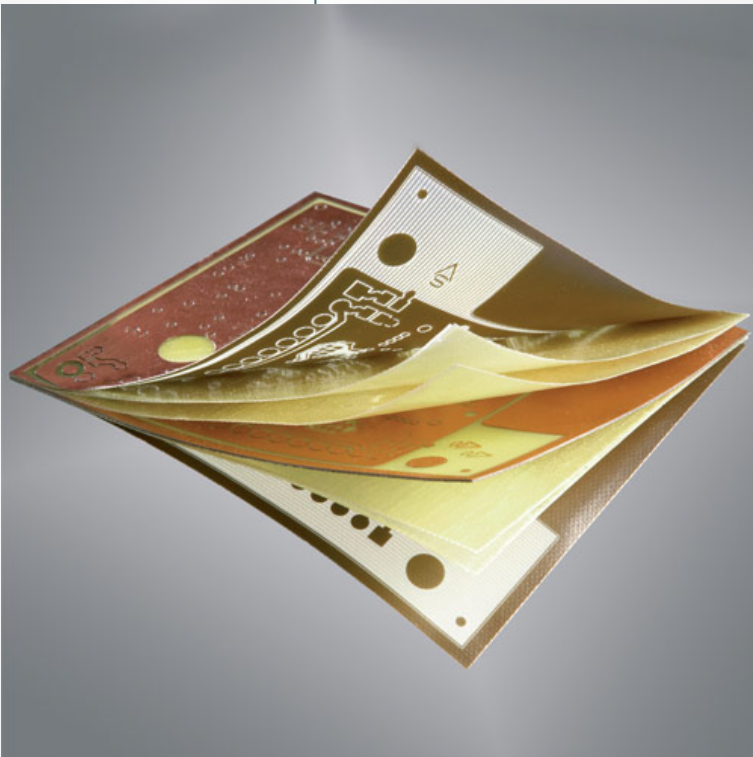
*Source: International Technology Roadmap for Semiconductors 2004



MULTILAYER SEQUENCE

CYNER
SUBSTRATES

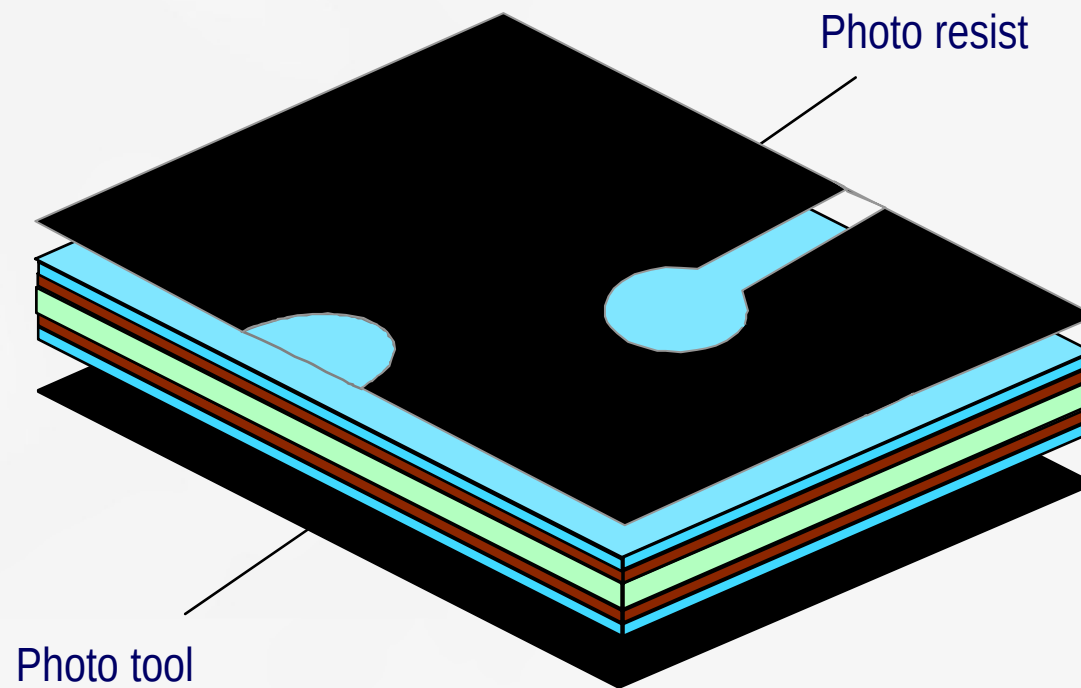
Copper-clad epoxy glass



MULTILAYER SEQUENCE

CYNER
SUBSTRATES

Image inner layer



Laminate photo resist - expose

MULTILAYER SEQUENCE

CYNER
SUBSTRATES

Image inner layer

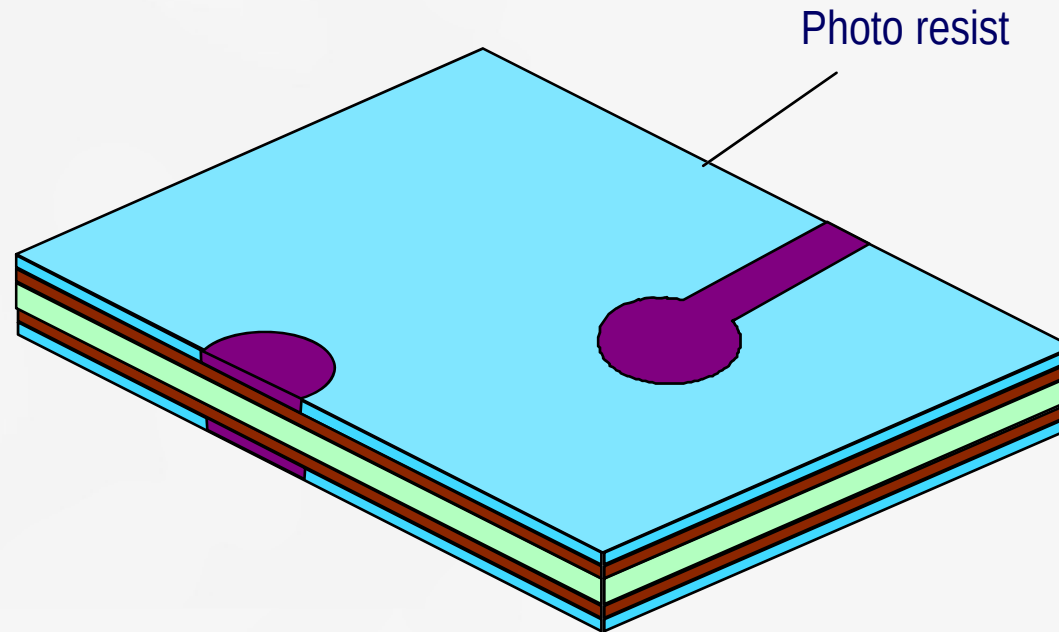


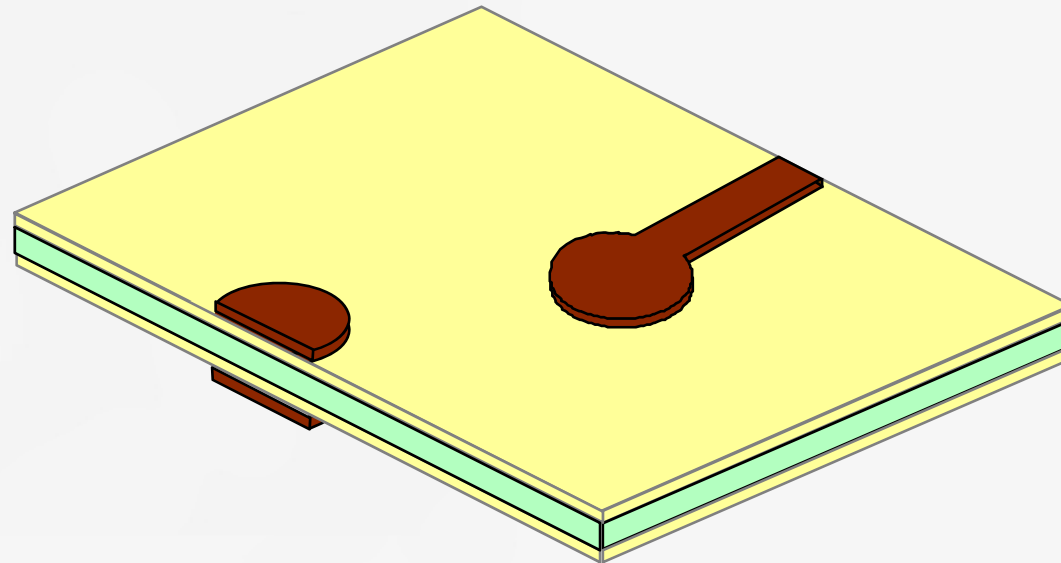
Photo resist

Expose

MULTILAYER SEQUENCE

CYNER
SUBSTRATES

Image inner layer

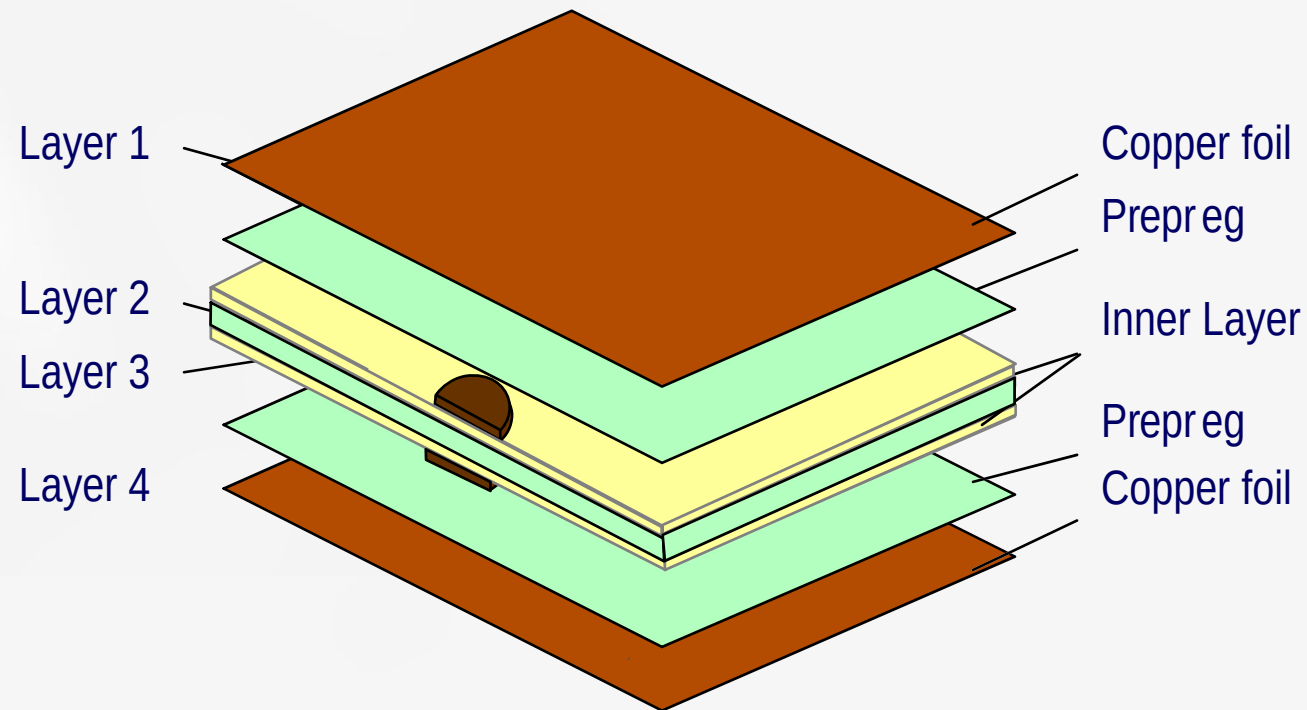


DES: develop-etch-strip

MULTILAYER SEQUENCE

CYNER
SUBSTRATES

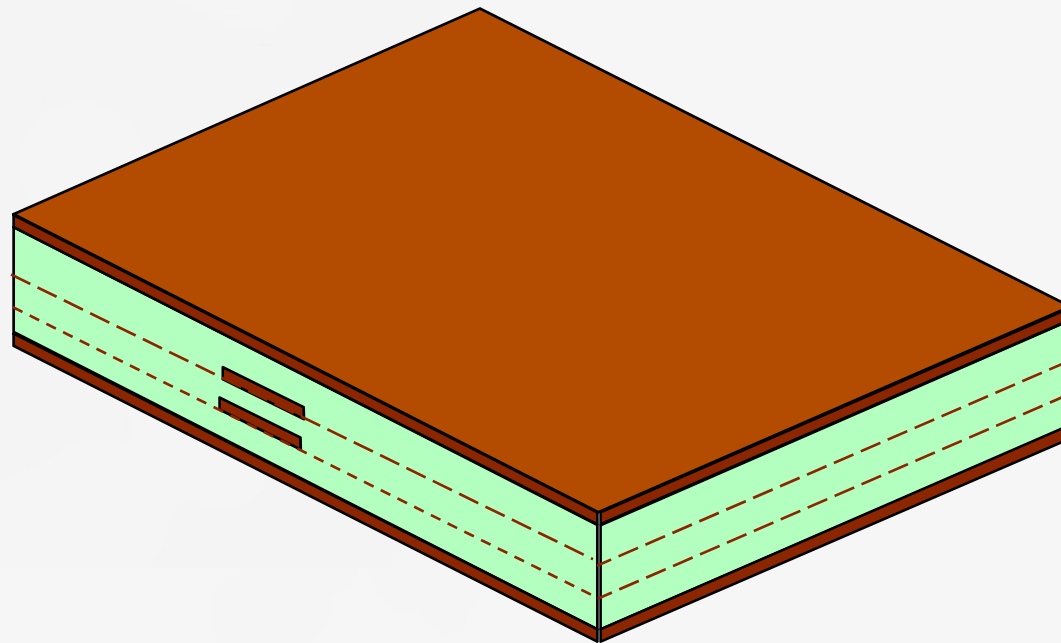
Lay up



MULTILAYER SEQUENCE

CYNER
SUBSTRATES

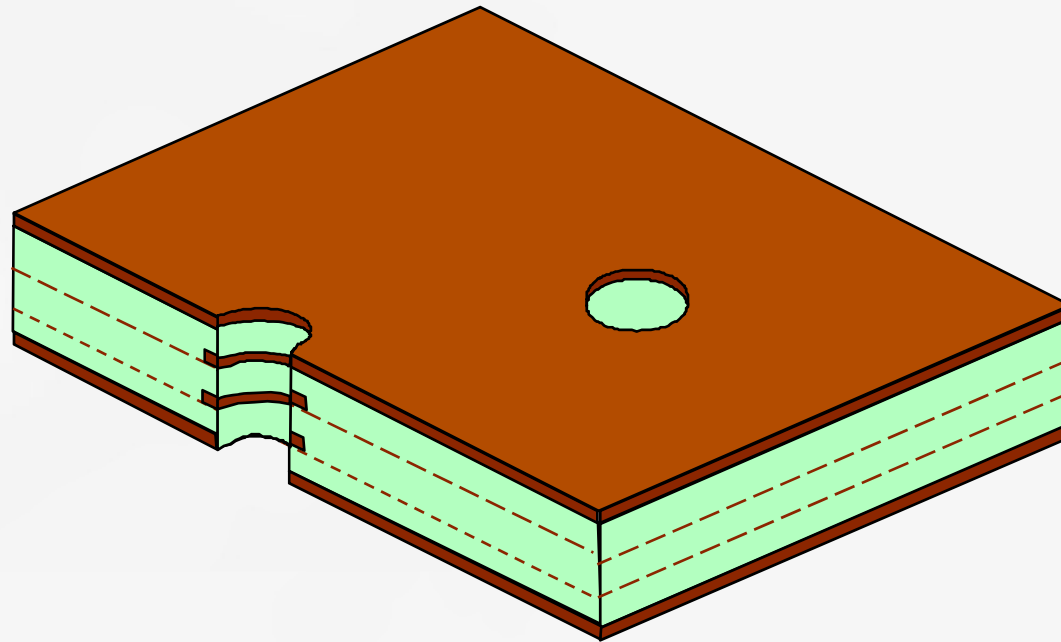
Laminate



MULTILAYER SEQUENCE

CYNER
SUBSTRATES

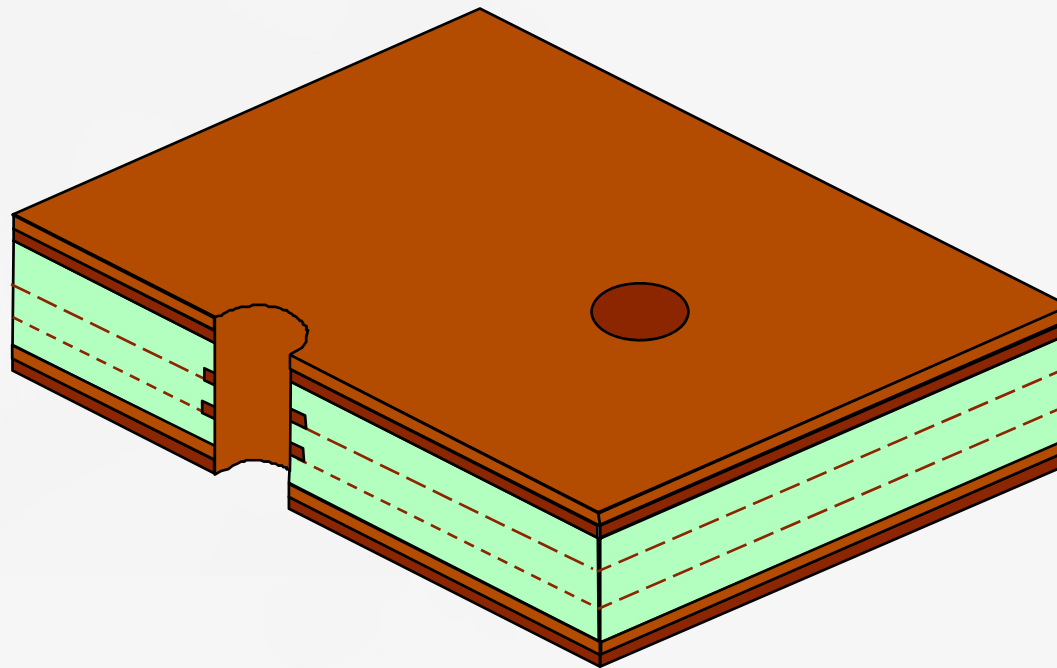
Drill



MULTILAYER SEQUENCE

CYNER
SUBSTRATES

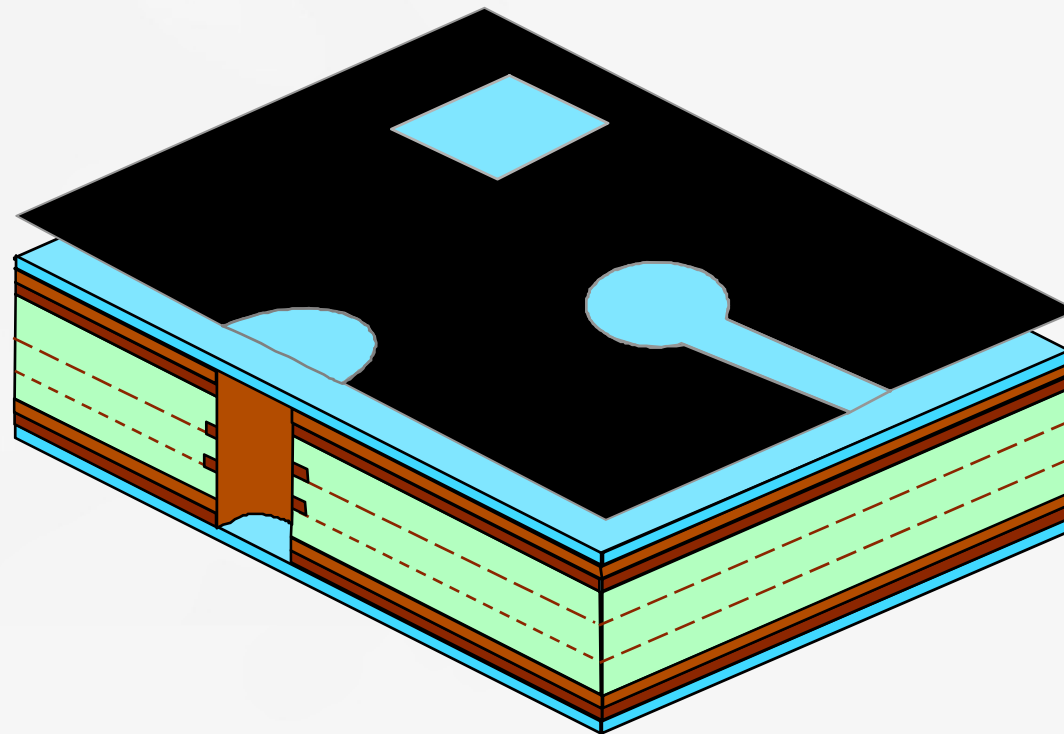
Electroless & electroplate copper plate



MULTILAYER SEQUENCE

CYNER
SUBSTRATES

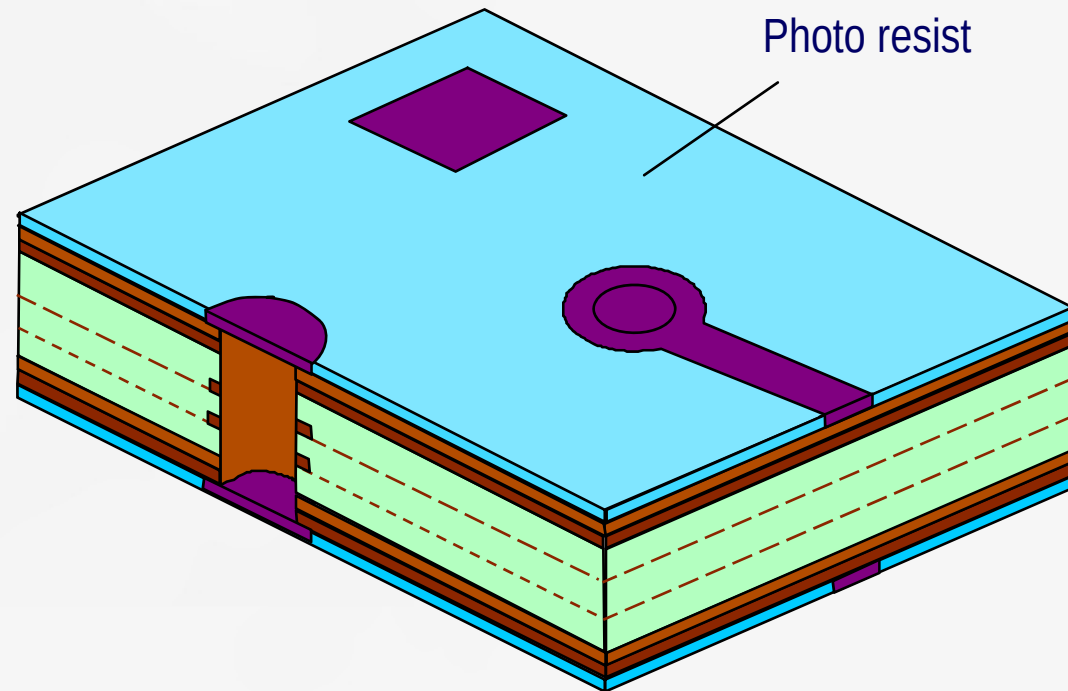
Image outer layer



MULTILAYER SEQUENCE

CYNER
SUBSTRATES

Image outer layer

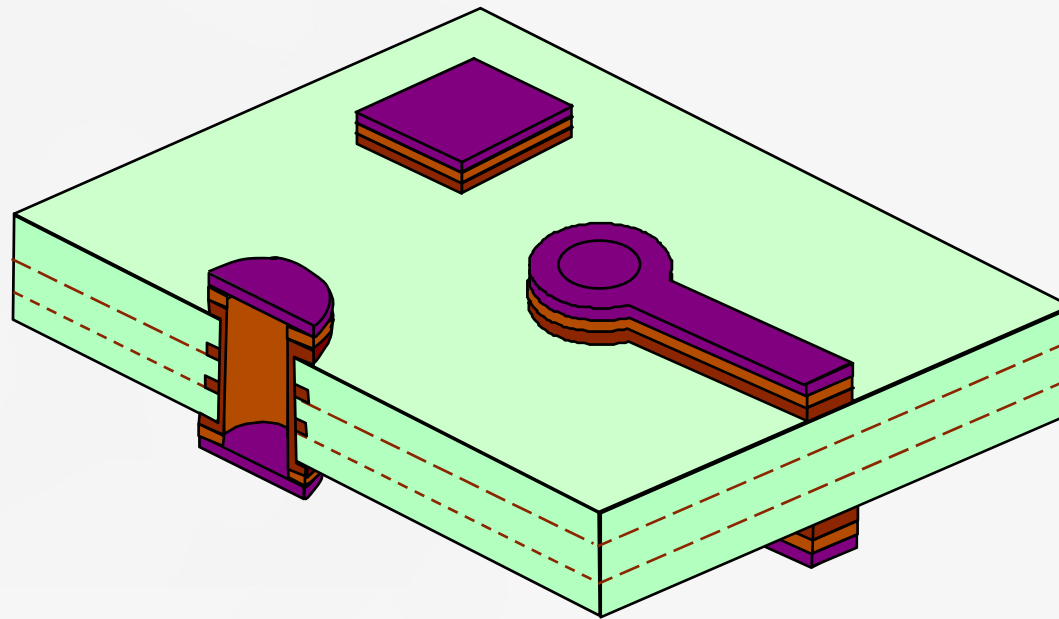


Laminate photo resist - expose

MULTILAYER SEQUENCE

CYNER
SUBSTRATES

Etch

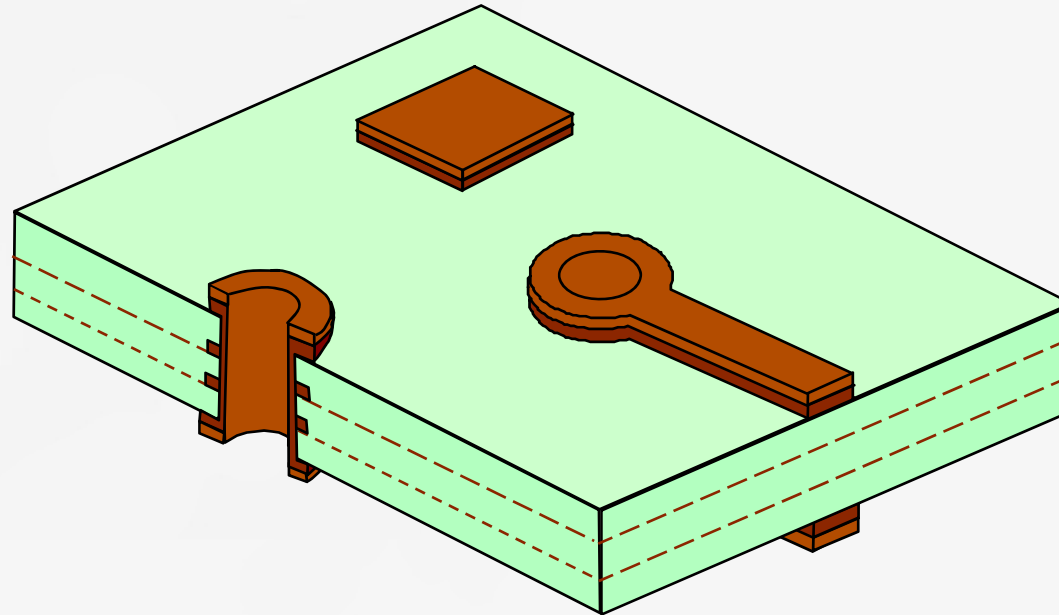


Remove unexposed photo resist-etch

MULTILAYER SEQUENCE

CYNER
SUBSTRATES

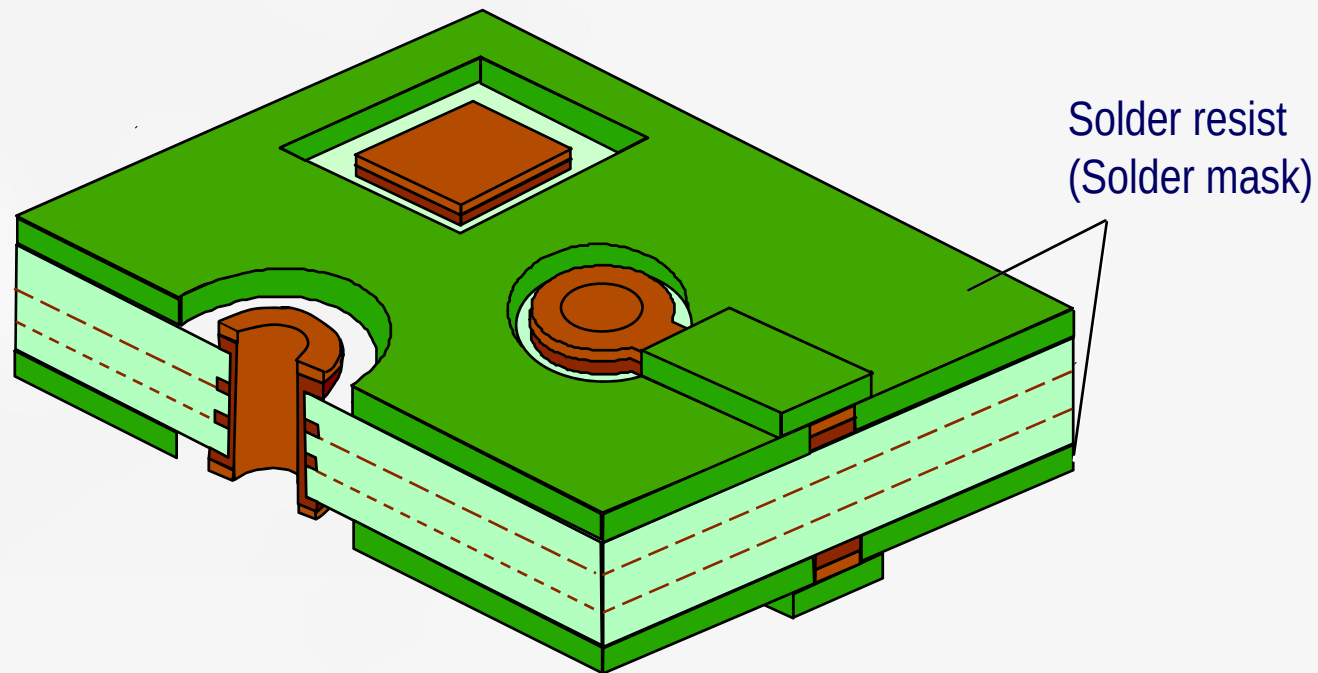
Strip etching resist



MULTILAYER SEQUENCE

CYNER
SUBSTRATES

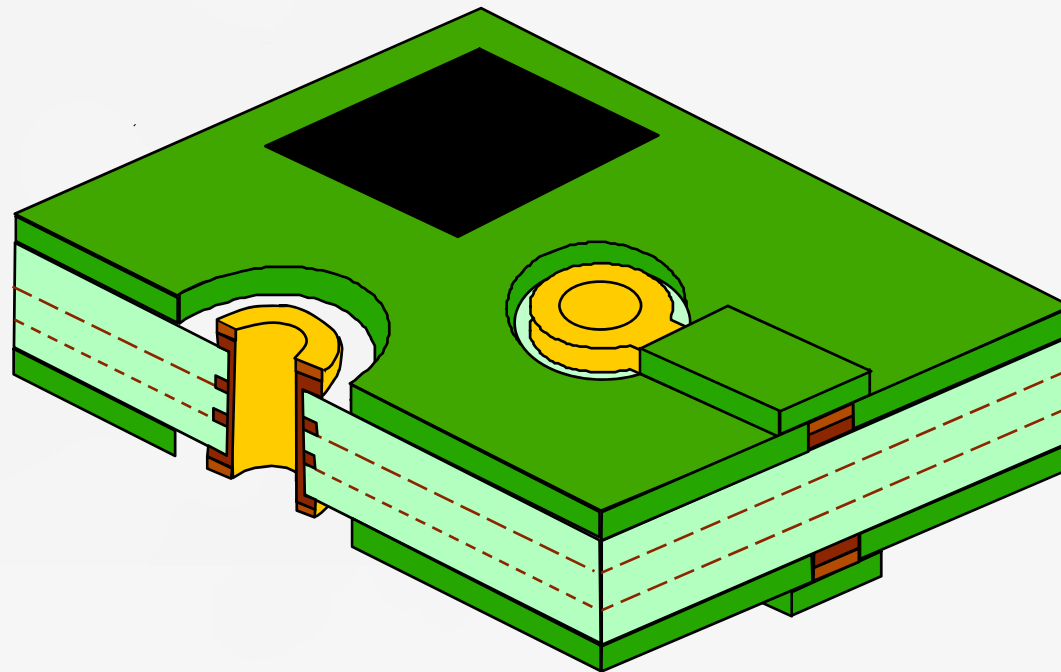
Solder mask



MULTILAYER SEQUENCE

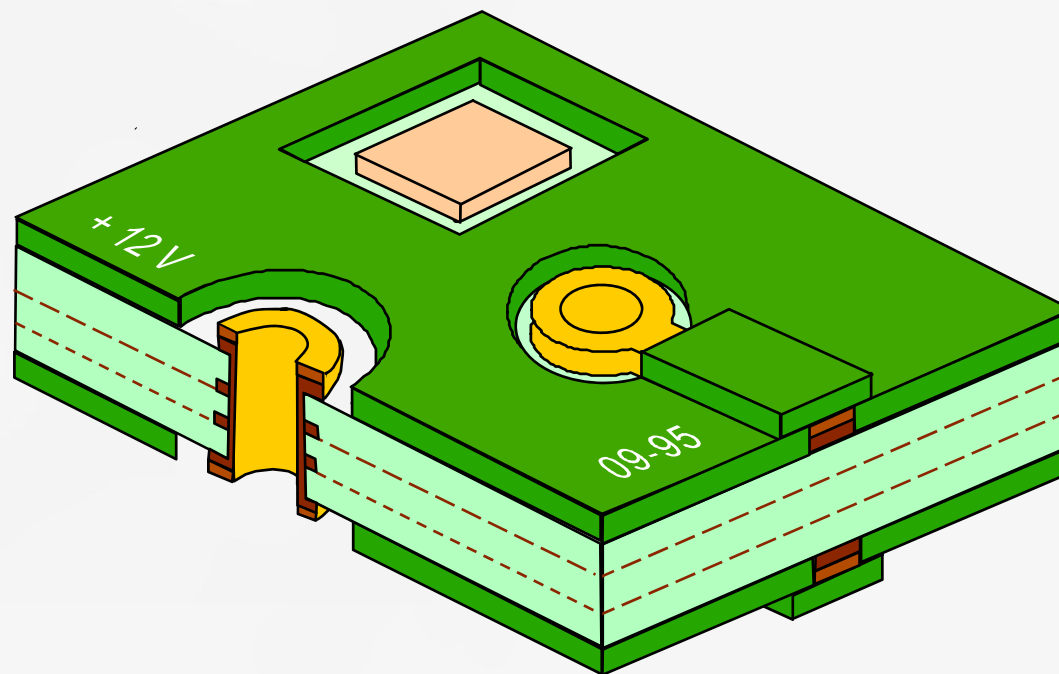
CYNER
SUBSTRATES

Enig-gold plating

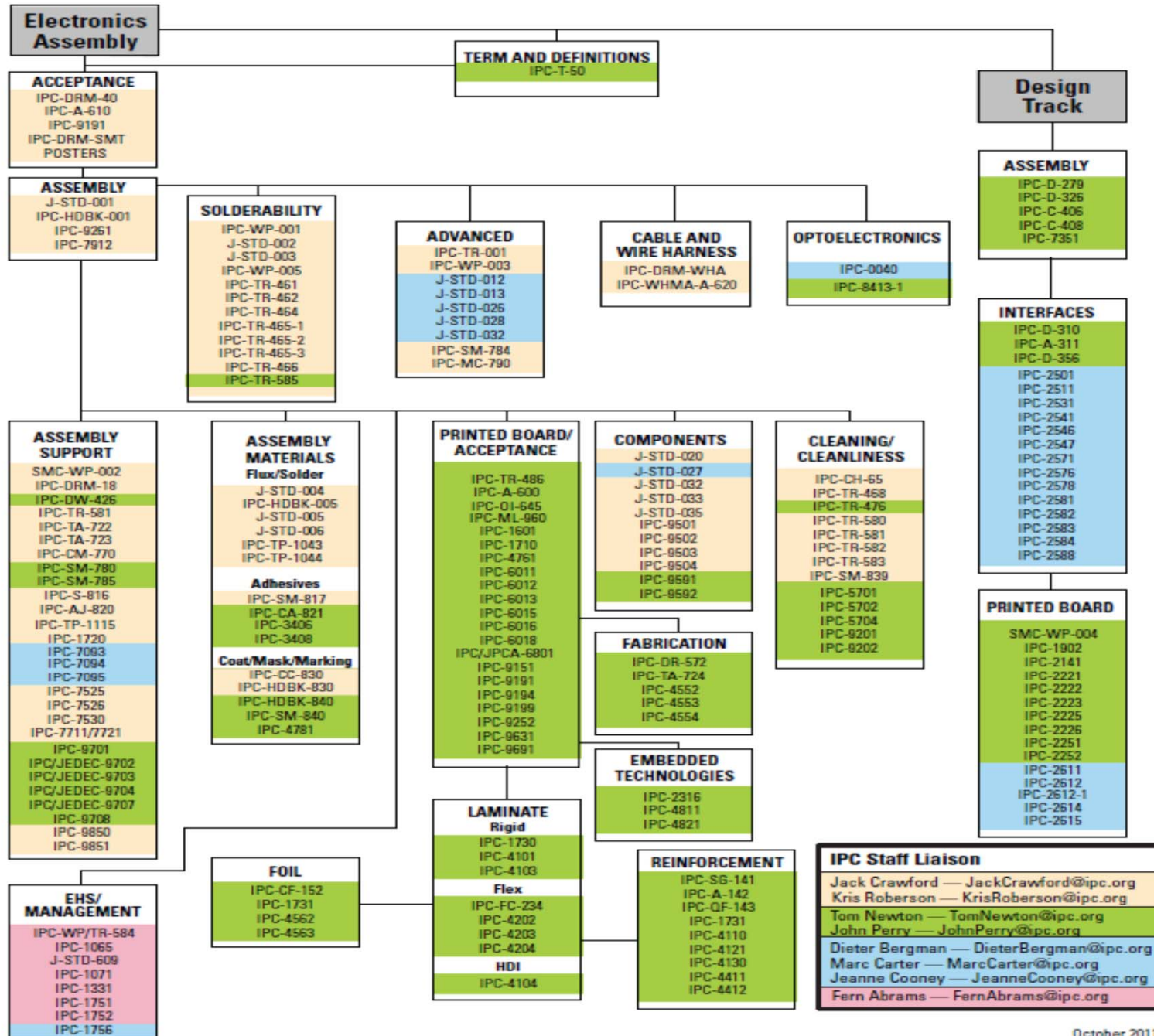


MULTILAYER SEQUENCE

Mark-testing - routing – OSP-packaging



IPC Specification Tree



IPC Standards

CYNER
SUBSTRATES

HIERARCHY OF IPC QUALIFICATION AND
PERFORMANCE SPECIFICATIONS
(6010 SERIES)

IPC-6011
GENERIC

IPC-6012
RIGID

IPC-6013
FLEX

IPC-6014
PCMCIA
(IN PROCESS)

IPC-6015
MCM-L

IPC-6016
HDI

IPC-6017
EMBEDDED
COMPONENTS
(IN PROCESS)

IPC-6018
HIGH
FREQUENCY



IPC Standards



- IPC-2141A Design Guide for High Speed Controlled Impedance Circuit Boards
- IPC-2221A Design Standard on Printed Board Design
- IPC-2251 Design Guide for the packaging of High Speed Electronics
- IPC-2252 Design Guide for RF/Microwave Circuits Boards.
- IPC-4101B Specification for Base Materials for Rigid and Multilayer Printed Boards
- IPC-4103 Specification for Base Materials for High Speed/High Frequency Applications
- IPC-6108B Microwave End Product Board Inspection and Test
- IPC Committees
 - D-20 High Speed/High Frequency (Overall Task group)
 - D-21A IPC-2251 Task Group
 - D-21B IPC-2252 Task Group
 - D-21C IPC-2141 Task Group
 - D-22 IPC-6018 Task Group
 - D-23 IPC-4103 Task Group
 - D-24A,B,C High Speed/High Frequency Test Methods Subcommittees



IPC Standards



PCB Types according to IPC 6018B*

- Type 1: Single Sided.
 - Type 2: Double Sided.
 - Type 3: Homogenous Multilayer Construction.
 - Type 4: Mixed Dielectric Multilayer.
 - Type 5: Homogenous Multilayer with blind and/or buried vias.
 - Type 6: Mixed Dielectric Multilayer with blind and/or buried vias.
 - Type 7: Metal and/or composite backed Boards.
 - Type 8: Multilayer metal and/or composite core Boards with blind and/or buried vias.
-
- Class 1: Consumer Products. v.b Mobile Phones
 - Class 2: General Industry. v.b Communication electronics
 - Class 3: High Reliability. v.b Militaire en Life support systems
-
- *Draft versie

Wat is Fr4?



- According to *ANSI/NEMA LI 1-1998 (1927)
- Industrial Laminating thermoset products Flame Retardant

	Reinforcement	Resin system	TG	IPC-4101B Klasse
FR 1	Paper	Phenolic	130	02
FR 2	Paper	Phenolic	105	04
FR 3	Paper	Epoxy	105	03/05
FR 4	Fiber glass	Epoxy	115	21/24/26/27/82/83/93/94/95/97/98 Leadfree 99/101/121/124/126/129
FR 5	Fiber glass	Epoxy	140	23

*National Electrical Manufacturers Association
American National Standards Institute

IPC 4101C



	TG	TD 5%	UL max	T 260	T 288	T 300	CTE Alpha1	CTE Alpha2	CTE 50-260	Filler
4101/99	150	325	AABUS	30MIN	5MIN	AABUS	60	300	3.50%	YES
4101/101	110	310	AABUS	30MIN	5MIN	AABUS	60	300	4.00%	YES
4101/121	110	310	AABUS	30MIN	5MIN	AABUS	60	300	4.00%	NO
4101/124	150	325	AABUS	30MIN	5MIN	AABUS	60	300	3.50%	NO
4101/126	170	340	130	30MIN	15MIN	2MIN	60	300	3.00%	YES
4101/129	170	340	130	30MIN	15MIN	2MIN	60	300	3.00%	NO
IS 104i	140	330	130	60MIN	5MIN	-	50	250	3.00%	YES
IS 410	180	350	150	60MIN	20MIN	>2MIN	65	250	3.50%	NO

Aabus= as agreed between user and supplier

New Types Low Halogen 122,125,127,128,130 and 131 in 4101C version

MicroWave Materials

Dk @ 10MHz	MATERIAL	SUPPLIER	Df @ 10MHz	CTE (ppm/°C)			Moisture Absorption (%)	Tg °C	Peel Strength (lbs/in)	Thermal Cond. (W/m/K)	Dk Breakdown (kV/mil)	UL-94	MIL S-13949	IPC L-125A	Available Thickness. shown in mils (0.001") 10	Max. Master Blank (Ins)	COMMENTS
				X	Y	Z											
2.10	DiClad 880	Arlon	0.0009	25	34	252	0.02	X	X	0.261	> 45	X	GY	125/05	5/10/15/20/30/50/60/125	48 x 54	Woven PTFE Unidirectional
2.10	Isoclad 917	Arlon	0.0013	46	47	236	0.04	X	X	0.263	> 45	X	GP,GR	125/03-04	5/10/15/20/31/45/62	36 x 72	Non-woven PTFE/Glass
2.10	CuFlon	Polyflon	0.0045	12.9	12.9	12.9	0.01	X	8	X	X	X	X	X	0.25/0.5/1/2/3/4/5/10/15/20/31/62/125	12 x 18	Pure PTFE
2.17	CuClad 217GY & LX	Arlon	0.0009	29	28	246	0.02	X	X	0.261	> 45	V0	GY	125/05	5/10/15/20/25/31/45/62/125	48 x 54	Woven PTFE Crossplied
2.17	MYIM 217	Metclad	0.0013	35	35	260	0.02	X	12-16	0.272	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.17	MYST 217	Metclad	0.0080	25	35	260	0.02	X	12.0	0.272	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.17	TLY5A	Taconic	0.0009*	20*	20*	280*	<0.02*	X	12.0*	0.400*	X	V0	GYN	X	31 and up	36 x 48	PTFE/Glass
2.20	CuClad 217GY & LX	Arlon	0.0009	29	28	246	0.02	X	X	0.261	> 45	V0	GY	125/05	5/10/15/20/25/31/45/62/125	48 x 54	Woven PTFE Crossplied
2.20	DiClad 880	Arlon	0.0009	25	34	252	0.02	X	X	0.261	> 45	X	GY	125/05	5/10/15/20/30/50/60/125	48 x 54	Woven PTFE Unidirectional
2.20	Isoclad 917	Arlon	0.0013	46	47	236	0.04	X	X	0.263	> 45	X	GP,GR	125/03-04	5/10/15/20/31/45/62	36 x 72	Non-woven PTFE/Glass
2.20	MYIM 220	Metclad	0.0013	35	35	260	0.02	X	12 -16	0.272	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.20	MYST 220	Metclad	0.0090	25	35	260	0.02	X	12.0	0.272	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.20	RT/Duriod 5880	Rogers	0.0009	31	48	237	0.015	X	X	0.200	X	X	X	X	5/10/15/20/31/62/125	18 x 48	Glass microfibre/PTFE
2.20	605	Taconic	0.0090*	20*	20*	280*	<0.02*	X	12.0*	0.400*	X	V0	X	X	5 and up	36 x 48	PTFE/Glass Equivalent to TLY-5
2.20	602	Taconic	0.0009*	20*	20*	280*	<0.02*	X	12.0*	0.400*	X	V0	X	X	5 and up	36 x 48	PTFE/Glass Equivalent to TLY-5
2.20	TLY5	Taconic	0.0009*	20*	20*	280*	<0.02*	X	12.0*	0.400*	X	V0	GYN	X	5 and up	36 x 48	PTFE/Glass
2.32	Polyguide	Polyflon	0.0005	10.8	10.8	10.8	<0.01	X	X	X	X	X	X	X	20/60/125/187	22.5 x 32	High density polyolefin
2.33	CuClad 233GY & LX	Arlon	0.0013	23	24	194	0.02	X	X	0.258	> 45	V0	GY	125/05	5/10/15/20/31/45/62/125	48 X 54	Woven PTFE Crossplied
2.33	DiClad 870	Arlon	0.0013	17	29	217	0.02	X	X	0.257	> 45	X	GY	125/05	5/10/15/20/30/40/60/125	48 x 54	Woven PTFE Unidirectional
2.33	Isoclad 933	Arlon	0.0016	31	35	203	0.05	X	X	0.263	> 45	X	GP	125/03	5/10/15/20/31/45/62	36 X 72	Non-woven PTFE/Glass
2.33	MYIM 233	Metclad	0.0013	35	35	260	0.02	X	12-16	0.272	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.33	MYST 233	Metclad	0.0011	25	35	260	0.02	X	12.0	0.272	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.33	RT/Duriod 5870	Rogers	0.0012	22	28	173	0.015	X	X	0.220	X	X	X	X	5/10/15/20/31/62/125	18 x 48	Glass microfibre/PTFE
2.33	TLY3	Taconic	0.0009*	20*	20*	280*	<0.02*	X	12.0*	0.400*	X	V0	GYN	X	3 and up	36 x 48	PTFE/Glass
2.40	CuClad 250 GX 3	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	GX	125/02	4/30/60	48 x 54	Woven PTFE Crossplied
2.40 7	DiClad 522	Arlon	0.0010	14	21	173	0.03	X	X	0.254	> 45	V0	GT	125/01	10/15/20/24/31/47/62/93/128/187/250	48 x 54	Woven PTFE Unidirectional
2.40	DiClad 527	Arlon	0.0022	14	21	182	0.03	X	X	0.254	> 45	V0	GX	125/02	20/31/62	48 x 54	Woven PTFE Unidirectional
2.40-2.60	Ultralam 2000	Rogers	0.0022	9.5	9.5	120	0.03	X	3.0	X	>50	X	X	X	40/101/147/190/300/600	18 x 48	Woven glass/PTFE
2.41	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	60	48 x 54	Woven PTFE Crossplied
2.42	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	60	48 x 54	Woven PTFE Crossplied
2.43	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	19.3/60	48 x 54	Woven PTFE Crossplied
2.43	MXIM 243	Metclad	0.0016	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	X	36 X 48	Woven glass/PTFE
2.43	MXST 243	Metclad	0.0016	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	X	36 X 48	Woven glass/PTFE
2.44	CuClad 250 GX 3	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	GX	125/02	14.7	48 x 54	Woven PTFE Crossplied
2.44	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	14.7	48 x 54	Woven PTFE Crossplied
2.45	CuClad 250 GX 3	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	GX	125/02	10/20/30/31/60/62/125	48 x 54	Woven PTFE Crossplied
2.45	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	30/31/60/125	48 x 54	Woven PTFE Crossplied
2.45 7	DiClad 522	Arlon	0.0010	14	21	173	0.03	X	X	0.254	> 45	V0	GT	125/01	31/62	48 x 54	Woven PTFE Unidirectional
2.45	DiClad 527	Arlon	0.0022	14	21	182	0.03	X	X	0.254	> 45	V0	GX	125/02	10/15/20/31/62/93/125	48 x 54	Woven PTFE Unidirectional
2.45	MXIM 245	Metclad	0.0016	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.45	MXST 245	Metclad	0.0016	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.45	TLT07	Taconic	0.0006*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GTN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.45	TLX0 6	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GXN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.48	CuClad 250 GX 3	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	GX	125/02	10/14.7/20/93	48 x 54	Woven PTFE Crossplied
2.48	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	10.1	48 x 54	Woven PTFE Crossplied
2.48	MXIM 248	Metclad	0.0017	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	X	36 X 48	Woven glass/PTFE

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Dk @ 10MHz	MATERIAL	SUPPLIER	Df @ 10MHz	CTE (ppm/°C)			Moisture Absorption (%)	Tg °C	Peel Strength (lbs/in)	Thermal Cond. (W/m/K)	Dk Breakdown (kV/mil)	UL - 94	MIL S-13949	IPC L-125A	Available Thickness. shown in mils (0.001") 10	Max. Master Blank (Ins)	COMMENTS
				X	Y	Z											
2.48	MXST 248	Metclad	0.0002	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	X	36 X 48	Woven glass/PTFE
2.50 7	CuClad 250 GT 2	Arlon	0.0010	18	19	177	0.03	X	X	0.254	> 45	V0	GT	125/01	10/15/20/31/47/62/94/125/187/250	48 x 54	Woven PTFE Crossplied
2.50	CuClad 250 GX 3	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	GX	125/02	20/30/47/60/62/125	48 x 54	Woven PTFE Crossplied
2.50	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	30/60/62.5/90/125	48 x 54	Woven PTFE Crossplied
2.50 7	DiClad 522	Arlon	0.0010	14	21	173	0.03	X	X	0.254	> 45	V0	GT	125/01	10/15/20/24/31/47/62/128/187/250	48 x 54	Woven PTFE Unidirectional
2.50	DiClad 527	Arlon	0.0022	14	21	182	0.03	X	X	0.254	> 45	V0	GX	125/02	5/10/15/20/31/47/62/128	48 x 54	Woven PTFE Unidirectional
2.50	AD 250	Arlon	0.0030	12	15	95	0.07	X	X	0.235	> 45	V0	N/A	N/A	20/31/62	48 x 54	Woven glass/PTFE
2.50	MXIM250	Metclad	0.0017	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.50	MXST 250	Metclad	0.0017	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.50	601	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	X	X	5/19/20/30/31	36 x 48	PTFE/Glass. Equivalent to TLT-9/TLX-9
2.50	602	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	X	X	5/19/20/30/31	36 x 48	PTFE/Glass. Equivalent to TLT-8/TLX-8
2.50	TLT9 7	Taconic	0.0006*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GTN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.50	TLX9 6	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GXN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.53	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	5.3	48 x 54	Woven PTFE Crossplied
2.54	601	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	X	X	5/19/20/30/31	36 x 48	PTFE/Glass. Equivalent to TLT-8/TLX-8
2.55	CuClad 250 GX 3	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	GX	125/02	10/14.7/20/30/60/62/125	48 x 54	Woven PTFE Crossplied
2.55	CuClad 250 LX	Arlon	0.0022	18	19	177	0.03	X	X	0.254	> 45	V0	X	X	10.1/14.7/30/60/62.5/125	48 x 54	Woven PTFE Crossplied
2.55 7	DiClad 522	Arlon	0.0010	14	21	173	0.03	X	X	0.254	> 45	V0	GT	125/01	10/15/31/47/62/93/128/250	48 x 54	Woven PTFE Unidirectional
2.55	DiClad 527	Arlon	0.0022	14	21	182	0.03	X	X	0.254	> 45	V0	GX	125/02	5/10/15/50/31/62/93/125	48 x 54	Woven PTFE Unidirectional
2.55	MXIM 255	Metclad	0.0018	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.55	MXST 255	Metclad	0.0018	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.55 5	Norclad	Polyflon	0.0011 5	53	53	53	0.06	X	8	X	X	X	X	X	60/125	20 x 22	Thermoplastic Polyphenylene Oxide 4
2.55	602	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	X	X	5/19/20/30/31	36 x 48	PTFE/Glass. Equivalent to TLT-9/TLX-8
2.55	TLT8 7	Taconic	0.0006*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GTN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.55	TLX8 6	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GXN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.60 7	DiClad 522	Arlon	0.0010	14	21	173	0.03	X	X	0.254	> 45	V0	GT	125/01	24/31/47/62/128/250	48 x 54	Woven PTFE Unidirectional
2.60	DiClad 527	Arlon	0.0022	14	21	182	0.03	X	X	0.254	> 45	V0	GX	125/02	10/31/62	48 x 54	Woven PTFE Unidirectional
2.60	MXIM 260	Metclad	0.0019	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	X	36 X 48	Woven glass/PTFE
2.60	ComClad HF	Sheldahl	0.00325*	59*	59*	59*	0.07*	140	6.0*	0.190*	X	V2	X	X	20/30/60/90	18 x 24	Noryl Thermoset Resin
2.60	ComClad HF	Sheldahl	0.00325*	59*	59*	59*	0.07*	140	6.0*	0.190*	X	V2	X	X	30/60	24 x 110	Noryl Thermoset Resin
2.60	MXST 260	Metclad	0.0019	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	X	36 X 48	Woven glass/PTFE
2.60	TLT7 7	Taconic	0.0006*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GTN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.60	TLX7 6	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GXN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.65	TLT6 7	Taconic	0.0006*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GTN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.65	TLX6 6	Taconic	0.0019*	9-12*	9-12*	140*	<0.02*	X	12.0*	0.340*	X	V0	GXN	X	5/19/20/30/31	36 x 48	PTFE/Glass
2.70	AD 270	Arlon	0.0030	12	15	95	0.07	X	X	0.235	> 45	V0	N/A	N/A	15/20/31/62	48 x 54	Woven glass/PTFE
2.70	MXST 270	Metclad	0.0020	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	X	36 X 48	Woven glass/PTFE
2.70	TLC27	Taconic	0.0030*	9-12*	9-12*	70*	<0.02*	X	12.0*	0.320*	X	V0	X	X	14.5	36 x 48	PTFE/Glass
2.80	MXST 280	Metclad	0.0021	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	X	36 X 48	Woven glass/PTFE
2.94	CLTE	Arlon	0.0025	10	12	40	0.04	X	X	0.500	> 45	V0	N/A	N/A	5/10/20/24/31/47/62/93/125/150	36 x 72	Ceramic/Woven PTFE
2.94	CLTE-LC	Arlon	0.0025	10	12	35	0.04	X	X	0.500	> 45	V0	N/A	N/A	X	36 x 72	Ceramic/Woven PTFE
2.94	MXIM 294	Metclad	x	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.94	MHST 294	Metclad	0.0022	9	12	71	0.08	X	12.0	0.230	45	V0	X	YES	5/10/15	36 X 48	Ceramic filled woven glass
2.94	MXST 294	Metclad	X	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
2.94	RT/Duroid 6002	Rogers	0.0012	16	16	24	0.10	X	X	0.600	X	X	X	X	5/10/20/30/60	18 x 48	PTFE composite
2.95	AD 295	Arlon	0.0030	12	15	95	0.07	X	X	0.235	> 45	V0	N/A	N/A	62	48 x 54	Woven glass/PTFE

MicroWave Materials

Dk @ 10MHz	MATERIAL	SUPPLIER	Df @ 10MHz	CTE (ppm/°C)			Moisture Absorption (%)	Tg °C	Peel Strength (lbs/in)	Thermal Cond. (W/m/K)	Dk Breakdown (kV/mil)	UL-94	MIL S-13949	IPC L-125A	Available Thickness. shown in mils (0.001") 10	Max. Master Blank (Ins)	COMMENTS
				X	Y	Z											
				9-12*	9-12*	70*											
2.95	TLE95	Taconic	0.0030*	9-12*	9-12*	70*	<0.02*	X	12.0*	0.320*	X	V0	X	X	5.2	36 x 48	PTFE/Glass
3.00	AD 300	Arlon	0.0030	12	15	95	0.07	X	X	0.235	> 45	V0	N/A	N/A	20/31/62	48 x 54	Woven glass/PTFE
3.00	MHST 300	Metclad	0.0023	9	12	71	0.08	X	12.0	0.230	45	V0	X	YES	10/15	36 X 48	Ceramic filled woven glass
3.00	MXST 300	Metclad	X	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	20/30/31/50/60/62/125	36 X 48	Woven glass/PTFE
3.00	RO3003	Rogers	0.0013	17	17	24	<0.10	X	6.0	0.500	X	V0	X	X	5/10/20/30/60	18 x 24	Ceramic filled PTFE
3.00	TLC30	Taconic	0.0030*	9-12*	9-12*	70*	<0.02*	X	12.0*	0.320*	X	V0	X	X	20/30/67	36 x 48	PTFE/Glass
3.05 5	Ultem	Polyflon	0.0030 5	56	56	56	0.25	X	X	X	X	X	X	X	30/60	12 x 18	Polyetherimide
3.20	GML 1032	GIL	0.0040	30	30	70	0.10	145	5.0	0.264	X	V0	X	X	30	36 x 120	Polyester
3.20	GML 1032	GIL	0.0040	30	34	70	0.05	145	5.0	0.276	X	V0	X	X	60	36 x 120	Polyester
3.20	GML 2032	GIL	0.0029	20	32	80	0.06	180	5.0	0.289	X	V0	X	X	30	36 x 120	Polyester
3.20	GML 2032	GIL	0.0029	24	25	95	0.13	180	5.0	0.269	X	V0	X	X	20	36 x 120	Polyester
3.20	MXIM 320	Metclad	x	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	30/31/50/60/62/125	36 X 48	Woven glass/PTFE
3.20	AR 320	Arlon	0.0030	10	12	71	0.08	X	X	0.230	> 45	V0	N/A	N/A	24/31/47/62/93/125	48 x 54	Ceramic filled PTFE/Glass
3.20	MHST 320	Metclad	0.0024	9	12	71	0.08	X	12.0	0.230	45	V0	X	YES	5/10/15/20	36 X 48	Ceramic filled woven glass
3.20	MXST 320	Metclad	X	12	18	150	0.05	X	12.0	0.251	50	V0	X	YES	30/31/50/60/62/125	36 X 48	Woven glass/PTFE
3.20	TLC32	Taconic	0.0030*	9-12*	9-12*	70*	<0.02*	X	12.0*	0.320*	X	V0	X	X	30 and up	36 x 48	PTFE/Glass
3.25	AD 325	Arlon	0.0030	12	15	95	0.07	X	X	0.235	> 45	V0	N/A	N/A	31/62	48 x 54	Woven glass/PTFE
3.25	AR 25N	Arlon	0.0024	17	17	70	0.08	X	X	0.446	X	N/A	N/A	N/A	6/8/10/12/18/20/24/30/60	36 x 48	Ceramic filled plastic
3.26	MHST 326	Metclad	0.0025	9	12	71	0.08	X	12.0	0.230	45	V0	X	YES	X	36 X 48	Ceramic filled woven glass
3.27	TMM 3	Rogers	0.0016	16	16	20	0.04	X	3.0	0.700	X	X	X	X	15/20/30/60/125	18 x 24	Ceramic/Thermoset Polymer
3.29	GML 1100	GIL	0.0040	22	19	76	0.10	165	7.0	0.840	X	V0	X	X	9.3	36 x 120	Polyester
3.30	LNB	Arlon	0.0030	17	17	70	0.08	90-95	4.0	0.450	X	X	X	X	19/31	X	Ceramic filled plastic
3.32	GML 1100	GIL	0.0040	22	19	80	0.03	160	5.0	0.208	X	V0	X	X	3.1	36 x 120	Polyester
3.38	GML 1034	GIL	0.0040	24	26	80	0.11	150	4.5	0.253	X	V0	X	X	20	36 x 120	Polyester
3.38	MHST 338	Metclad	0.0025	9	12	71	0.08	X	12.0	0.230	45	V0	X	YES	5/10/15/20/30/31/50/60/62/125	36 X 48	Ceramic filled woven glass
3.38	RO4003	Rogers	0.0020	11	14	46	0.06	>280	6.0	0.640	X	X	X	X	8/20/32/60	18 x 24	Glass reinforced ceramic
3.48	MHST 348	Metclad	0.0030	9	12	71	0.08	X	12.0	0.230	45	V0	X	YES	5/10/15/20/24/31/50/60/62/125	36 X 48	Ceramic filled woven glass
3.48	RO4350 (B)	Rogers	0.0040	14	16	50	0.06	>280	5.0	0.620	X	V0	X	X	10/20/30/60	18 x 24	Glass reinforced ceramic
3.50	AR 350	Arlon	0.0026	33	34	107	0.08	X	X	0.310	> 45	V0	N/A	N/A	6/10/15/20/24/31/47/93/125	36 x 72	Ceramic filled PTFE/Glass
3.50	MHST 350	Metclad	0.0030	9	12	71	0.08	X	12.0	0.230	45	V0	X	YES	X	36 X 48	Ceramic filled woven glass
3.50	RF-35 8	Taconic	0.0018	19-24	19-24	64	0.02	X	>10.0	0.200*	X	V0	X	X	10/20/30/60	36 x 48	Ceramic/PTFE/Woven glass
3.58	AR25FR	Arlon	0.0035	16	18	59	0.09	X	X	0.450	X	V0	N/A	N/A	6/8/10/12/18/20/24/30/58		Ceramic filled plastic
3.60	AD 360	Arlon	0.0030	12	15	95	0.07	X	X	0.235	> 45	V0	N/A	N/A	62	48 x 54	Woven glass/PTFE
4.50	AR 450	Arlon	0.0026	30	32	102	0.08	X	X	0.320	> 45	V0	N/A	N/A	20/24/31/47/62/93	36 x 72	Ceramic filled PTFE/Glass
4.50	TMM 4	Rogers	0.0017	14	14	20	0.01	X	3.0	0.700	X	X	X	X	15/20/30/60/125	18 x 24	Ceramic/Thermoset Polymer
6.00	AR 600	Arlon	0.0035	10	13	62	0.08	X	X	0.431	> 45	V0	N/A	N/A	10/15/20/24/31/50/62/93/125	36 x 72	Ceramic filled PTFE/Glass
6.00	TMM 6	Rogers	0.0018	16	16	20	0.06	X	3.0	0.720	X	X	X	X	15/25/50/75/100	12 x 18	Ceramic/Thermoset Polymer
6.15	RO3006	Rogers	0.0025	17	17	24	<0.10	X	6.0	0.610	X	V0	X	X	5/10/25/50	18 x 24	Ceramic filled PTFE
6.15	RT/Duroid 6006	Rogers	0.0019	47	34	117	0.05	X	X	0.490	X	X	X	X	10/25/50/75/100	20 x 20	PTFE composite
9.20	TMM 10	Rogers	0.0017	16	16	20	0.09	X	3.0	0.760	X	X	X	X	15/25/50/75/100	12 x 18	Ceramic/Thermoset Polymer
9.80	TMM 10i	Rogers	0.0015	16	16	20	0.16	X	3.0	0.700	X	X	X	X	15/25/50/75/100	12 x 18	Ceramic/Thermoset Polymer
10.0 1	AR 1000	Arlon	0.0035	14	16	37	0.08	X	X	0.645	> 45	V0	N/A	N/A	5/10/15/20/24/31/47/50/62/93/100/200	36 x 72	Ceramic filled PTFE/Glass
10.0	CER-10	Taconic	0.0035	13-15	13-15	46	0.02	X	5.0	0.290*	X	V0	X	X	25/47/50/62	36 x 48	Ceramic/PTFE/Woven glass
10.20	RO3010	Rogers	0.0035	17	17	24	<0.10	X	6.0	0.660	X	V0	X	X	5/10/25/50	18 x 24	Ceramic filled PTFE
10.20	RT/Duroid 6010	Rogers	0.0023	24	24	24	0.60	X	X	0.780	X	X	X	X	10/25/50/75/100	20 x 20	PTFE composite

MicroWave Materials and Bondfilms

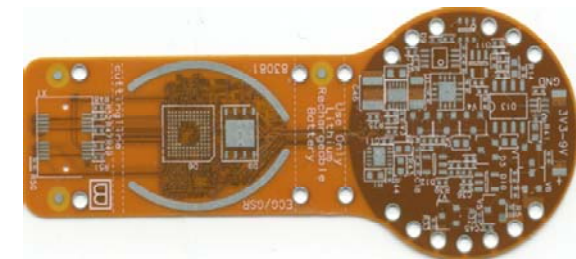
Dk @ 10MHz	MATERIAL	SUPPLIER	Df @ 10MHz	CTE (ppm/°C)			Moisture Absorption (%)	Tg °C	Peel Strength (lbs/in)	Thermal Cond. (W/m/K)	Dk Breakdown (kV/mil)	UL-94	MIL S-13949	IPC L-125A	Available Thickness. shown in mils (0.001") 10	Max. Master Blank (Ins)	COMMENTS
				X	Y	Z											
2.07	FEP-A	DuPont	~0.00027	X	X	X	<0.01	X	X	0.195	6.5	V0	X	X	0.5/1/2/3/5/7.5/10/20	X	PTFE thermoplastic film
2.07	FEP -C	DuPont	~0.00027	X	X	X	<0.01	X	X	0.195	6.5	V0	X	X	0.5/1/2/3/5	X	PTFE thermoplastic film
2.07	FEP C-20	DuPont	~0.00027	X	X	X	<0.01	X	X	0.195	6.5	V0	X	X	0.5/1/2/5	X	PTFE thermoplastic film
2.07	FEP -L	DuPont	~0.00027	X	X	X	<0.01	X	X	0.195	6.5	V0	X	X	0.3/1/2/3/7.5	X	PTFE thermoplastic film
2.07	PFA-LP	Dupont	~0.00057	X	X	X	<0.02	X	X	0.195	6.5	V0	X	X	0.5/1/2/5/7.5/10/20/30/60/90/125	X	PTFE thermoplastic film
2.07	PFA-CLP	Dupont	~0.00057	X	X	X	<0.02	X	X	0.195	6.5	V0	X	X	1/2/5.	X	PTFE thermoplastic film
2.28	RO3001	Rogers	0.0030	X	X	X	0.05	X	X	X	X	X	X	X	1.5	12" wide roll	Bond Film
2.32	CuClad 6250	Arlon	0.0013	X	X	X	X	X	X	X	X	X	X	X	1.5	24" x 150' Roll	Bond Film
2.35	CuClad 6700	Arlon	0.0025	X	X	X	0.005	X	X	X	X	X	X	X	1.5/3.0	24" x 150' Roll	Bond Film
2.35	FV6700	Metclad	0.0025	X	X	X	X	X	X	X	3.75	X	X	X	1.5	X	Bond Film
2.35	TacBond HT 1.5	Taconic	0.0025	X	X	X	0.005	X	X	X	X	X	X	X	1.5	X	Bond Film
2.60	Speedboard C	Gore	0.0036	X	X	X	X	220	X	X	X	V0	X	X	1.5/2/2.2/3.4	18 X 24	Pre-preg
2.94	CLTE-P	Arlon	X	X	X	X	X	X	X	X	X	X	X	X	3.2	X	Pre-preg
3.0	Speedboard N	Gore	X	X	X	X	X	140	X	X	X	X	X	X	1.5/2/3/3.5/4.5	18 X 24	Pre-preg
3.17	RO4403	Rogers	0.0005	19	16	80	0.05	>280	X	0.46	X	X	X	X	4	18 X 24	Pre-preg
X	Ablefilm 5025E	E and C9	X	65	65	65	X	90	2500	3.50	X	X	X	X	2/3/4/5/6	X	Silver filled epoxy adhesive
X	Ablefilm ECF 561	E and C9	X	100	100	100	X	47	2000	1.60	X	X	X	X	4/5/6.	X	Silver filled epoxy adhesive
X	Ablefilm ECF 561E	E and C9	X	100	100	100	X	44	1700	1.60	X	X	X	X	4/5/6.	X	Silver filled epoxy adhesive
X	CF 3350	E and C9	X	65	65	65	X	90	2500	7.0	X	X	X	X	2/3/4/5/6	X	Silver filled epoxy adhesive

* All values shown are typical only.

- 1 Varies with thickness
- 2 Thicknessess over copper
- 3 Thicknessess over dielectric
- 4 Requires solvent based processing
- 5 Tested at 3GHz
- 6 Values shown measured at 10GHz
- 7 Values shown measured at 1 MHz
- 8 Tested at 1.90GHz
- 9 Emerson and Cumings
- 10 Other thicknesses may be availble other than those shown. Please contact Labtech Ltd or the supplier for further details

•Please Note

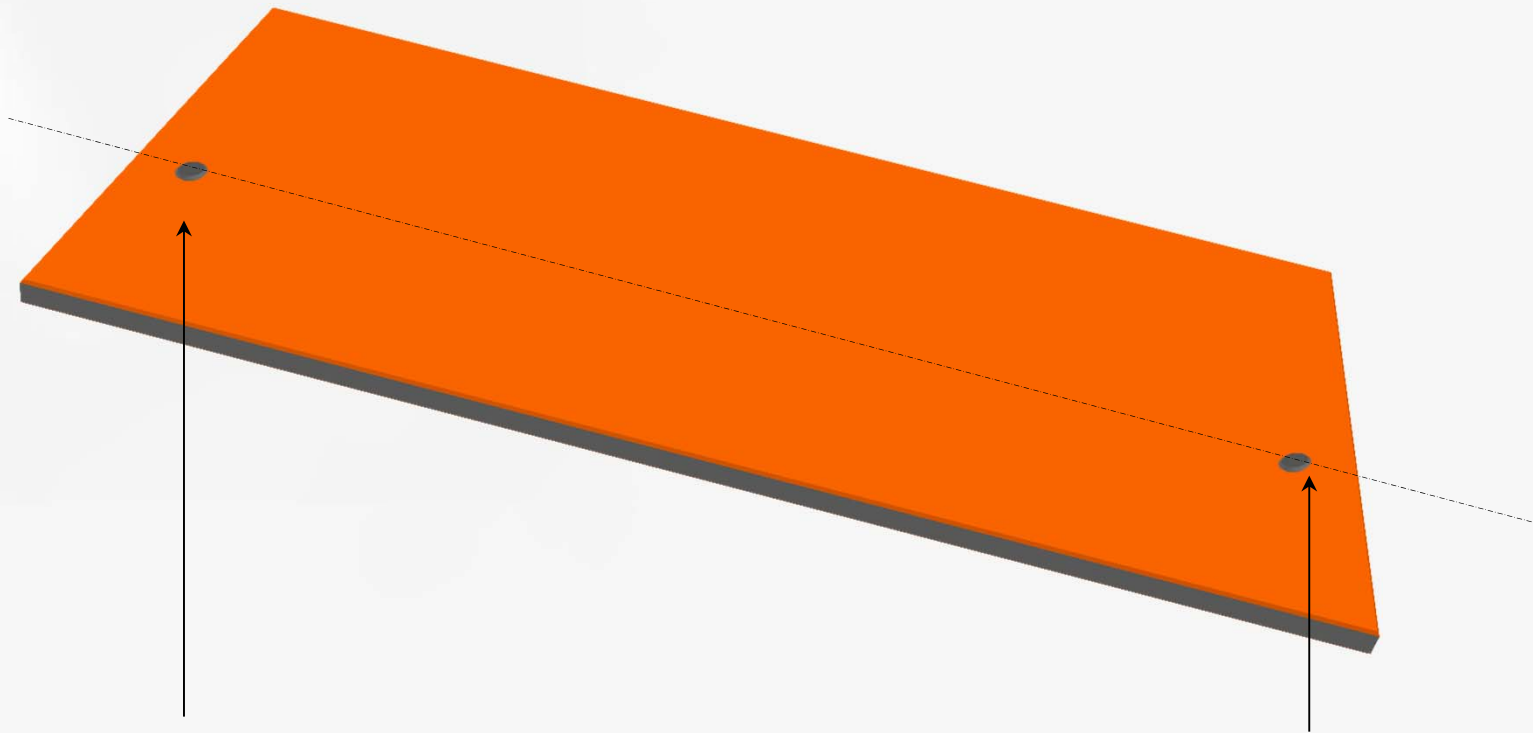
- All values given are nominal.
- No tolerances are quoted.



Materiaal Kwalificatie

CYNER
SUBSTRATES

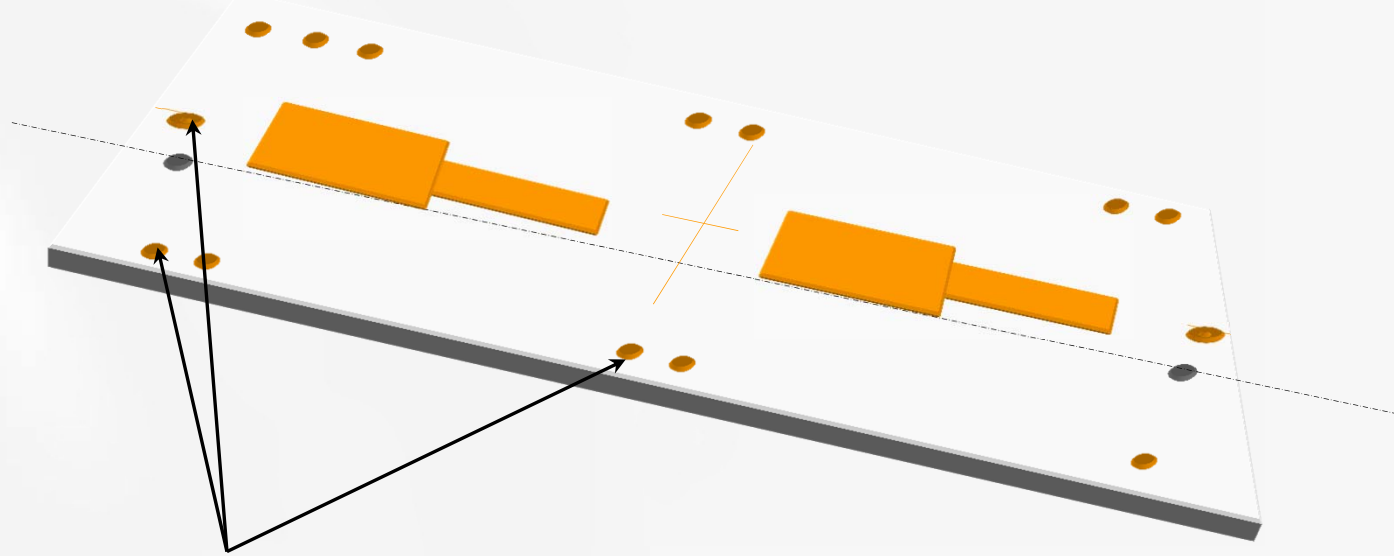
Duroid paneel enkel- of dubbelzijdig koper met twee geboorde gaten voor het belichten van “oversized” patroon



Geboorde gaten voor het belichten van “oversized” patroon.
Positie van deze gaten in relatie met patroon

Origineel patroon na het etsen

CYNER
SUBSTRATES

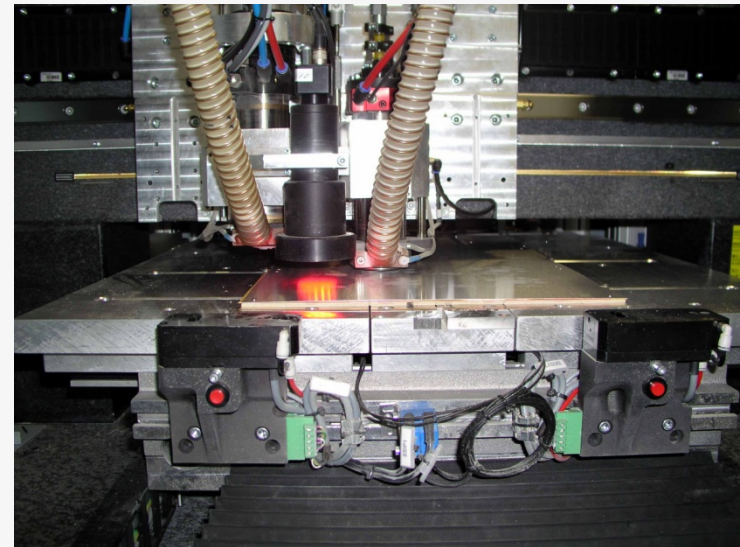


Het multilayer referentiegatenpatroon en de belichtingstarget worden d.m.v cameraboring of met handboormachine open geboord

Overige Kwalificaties.



- Naast Belichten, Ontwikkelen en Etsen moeten ook de volgende processen gekwalificeerd worden.
- Boor en Freesparameters.
- Plasma. Gasmix
- Persparameters
- AOI en Testen
- Werkvoorbereiding

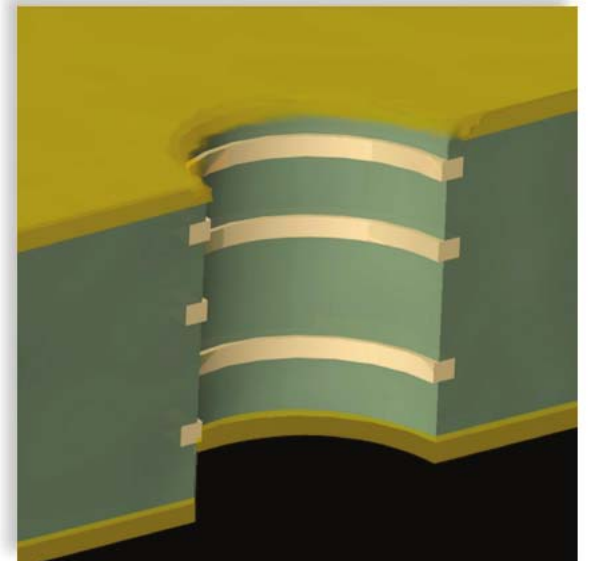
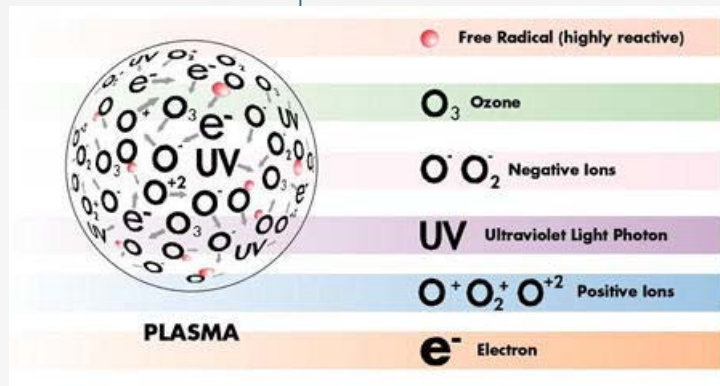


Plasma

CYNER
SUBSTRATES



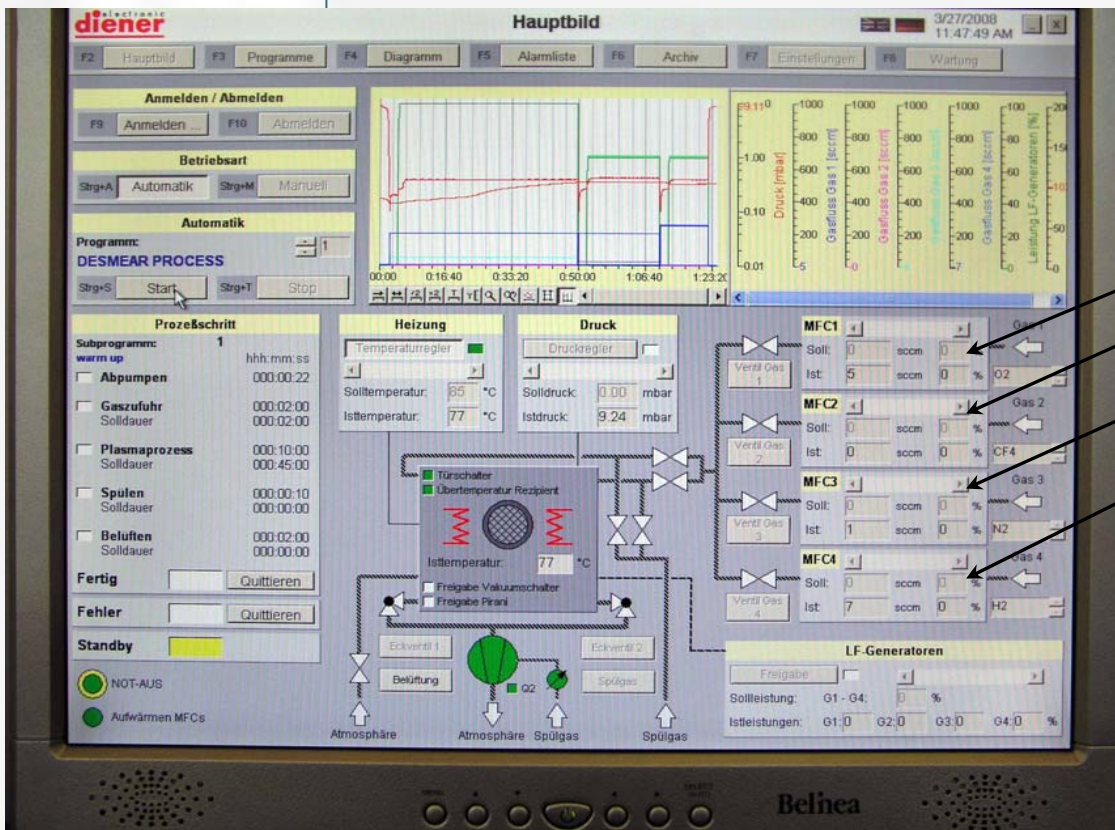
- Plasma vierde aggregatietoestand genoemd.
- Plasma is onontbeerlijk voor diversen pcb processen
- Teflon activatie
- Desmear van gaten
- Hechting van soldeermasker



Plasma

CYNER
SUBSTRATES

Teflon aktivieren



- Segment 1: Verwarmen panelen
- Segment 2: Desmear
- Segment 3: Reiniging
- Segment 4: Teflon activatie

μ BGA

CYNER
SUBSTRATES

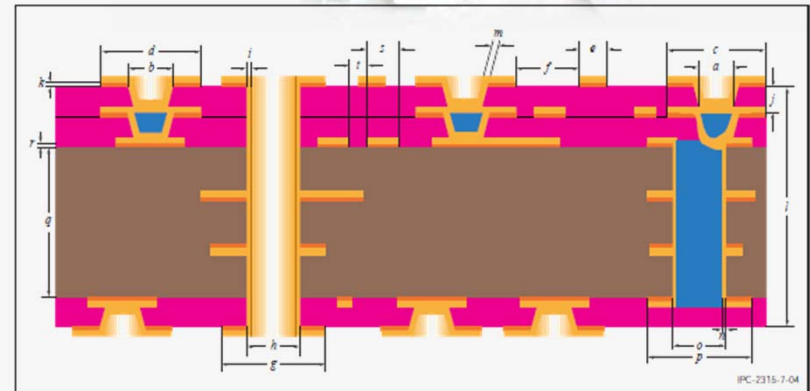
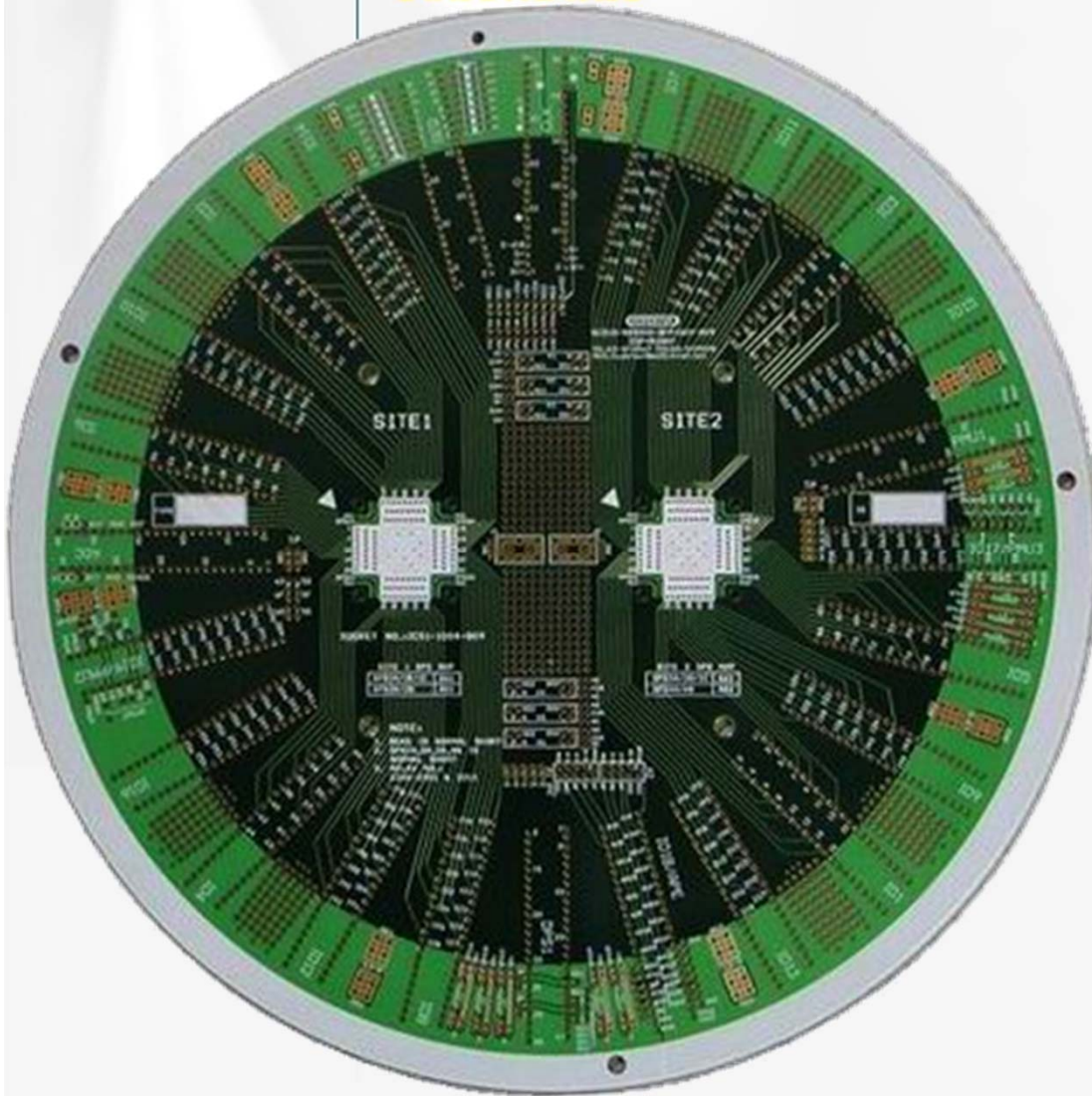
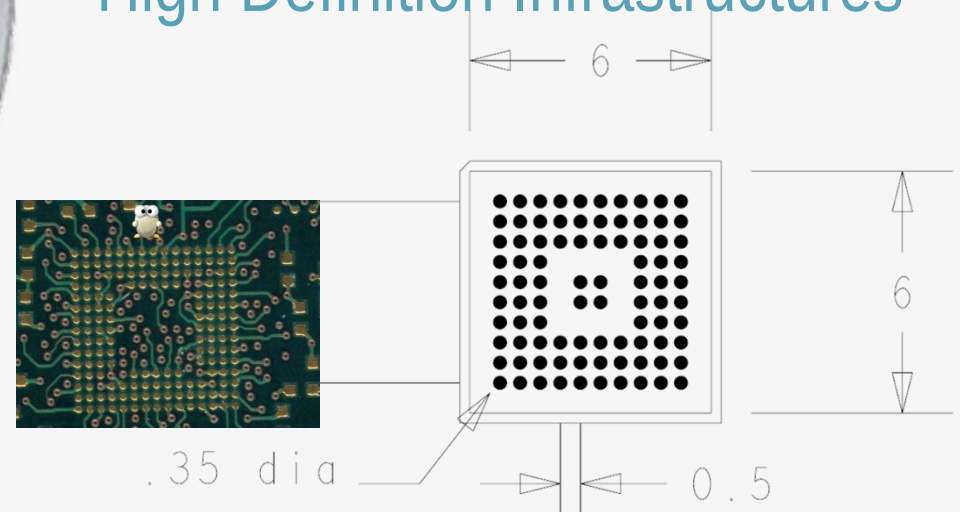


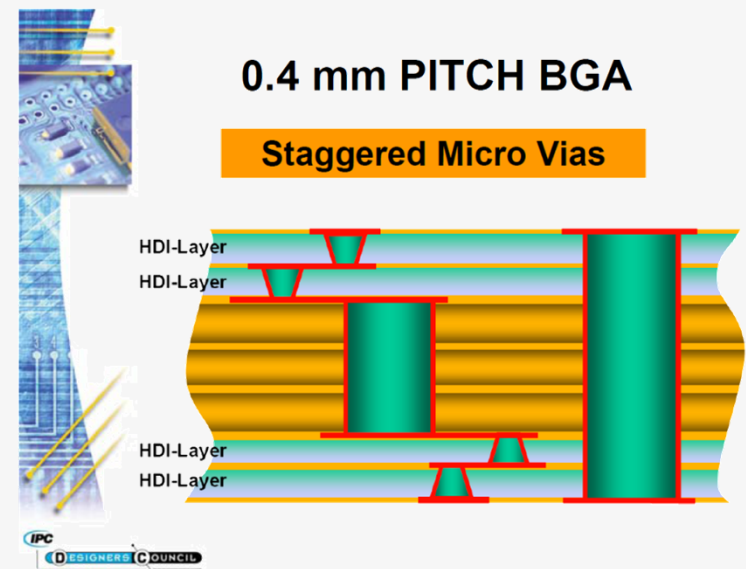
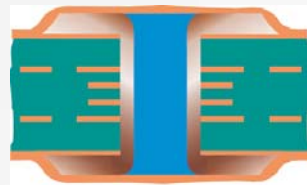
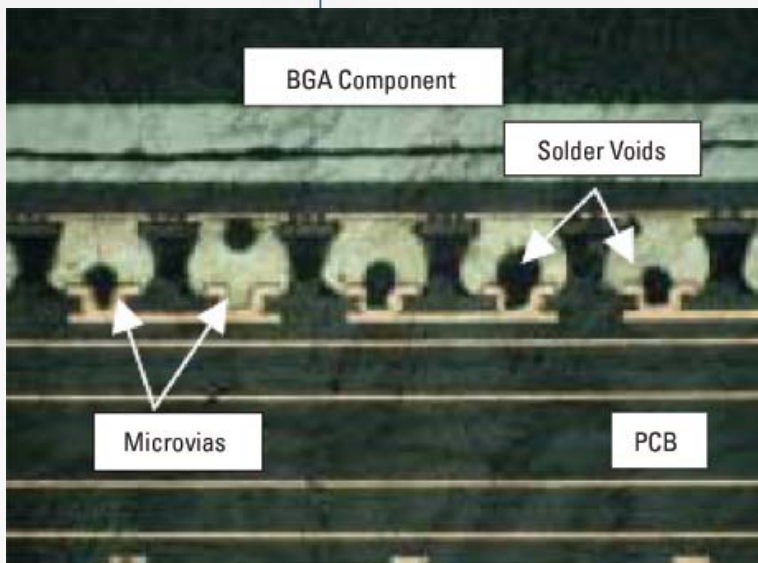
Figure 7-4 Design Example for Type III HDI with Stacked Microvias

High Definition Infrastructures

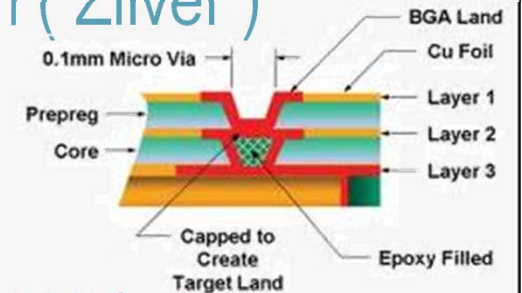


μBGA

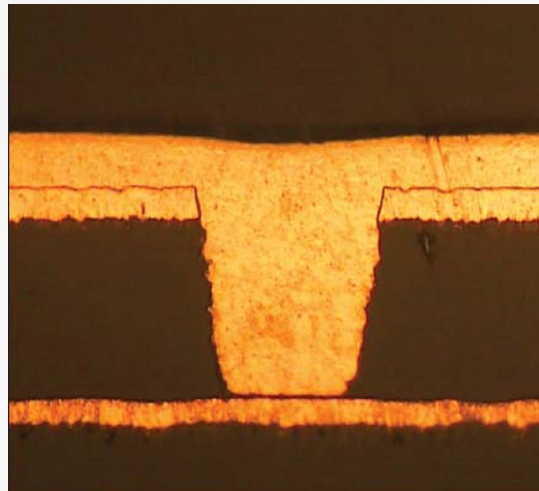
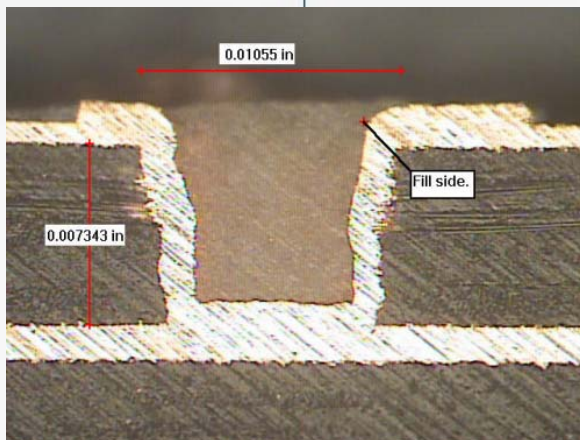
- Micro BGA's Fanout = Microvia's in pad
- Microvia's in pad = soldeer- en reliability problemen
- Voids als gevolg van via's in pad zijn uitgezonderd in IPC-610E
- Via's Filled and Capped type 7



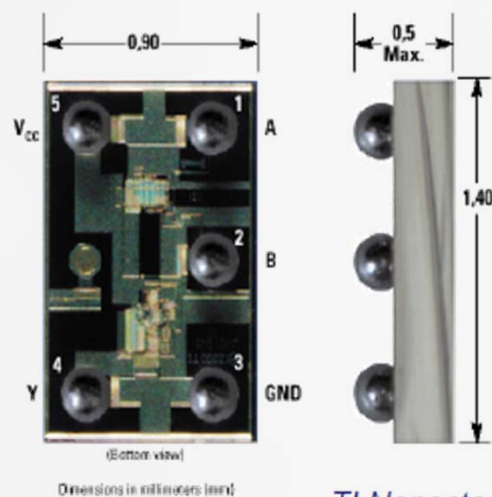
- CTE Mismatch als gevolg van materialen (Zilver)
- Betrouwbare verbinding ??
- Koper de oplossing??
- Thermische geleidbaarheid 400 i.p.v. 5,23 W/mK
zilver gevulde epoxy.



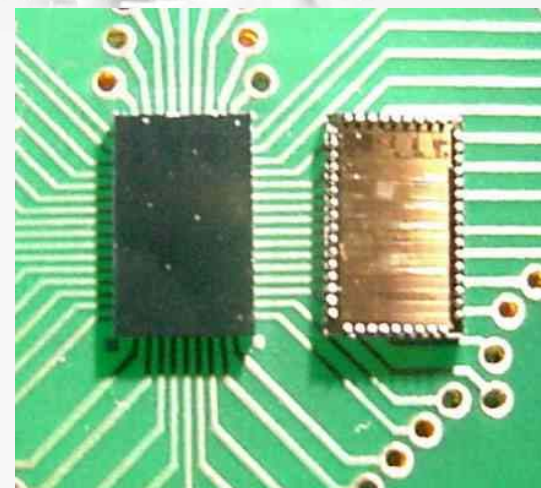
Plugged with Peters
Paste PP2795



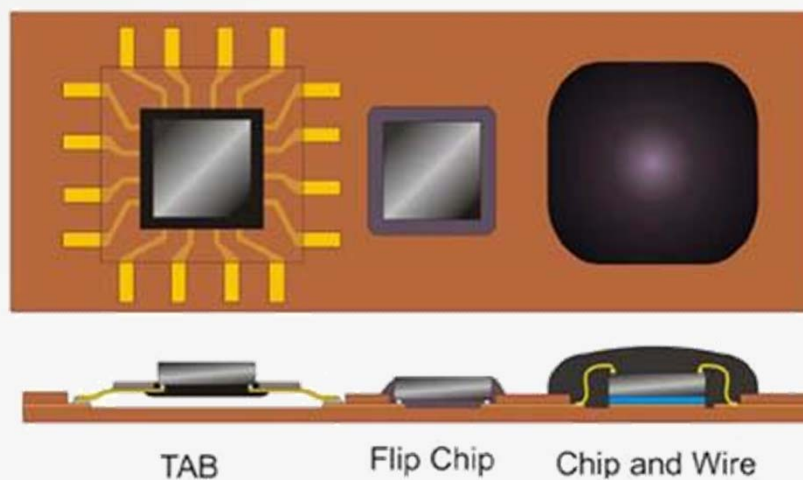
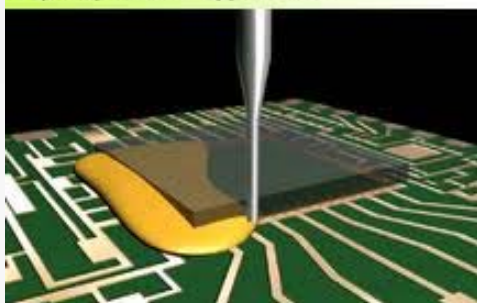
Flip-Chip on Flex



TI Nanostar



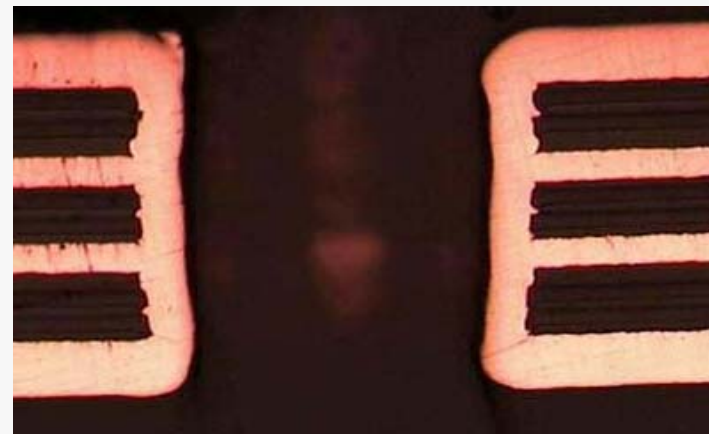
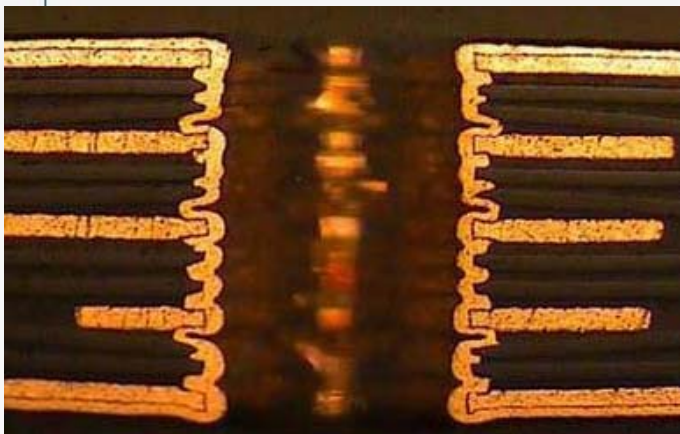
Flip Chip Underfill applications



Flip-Chip on Flex

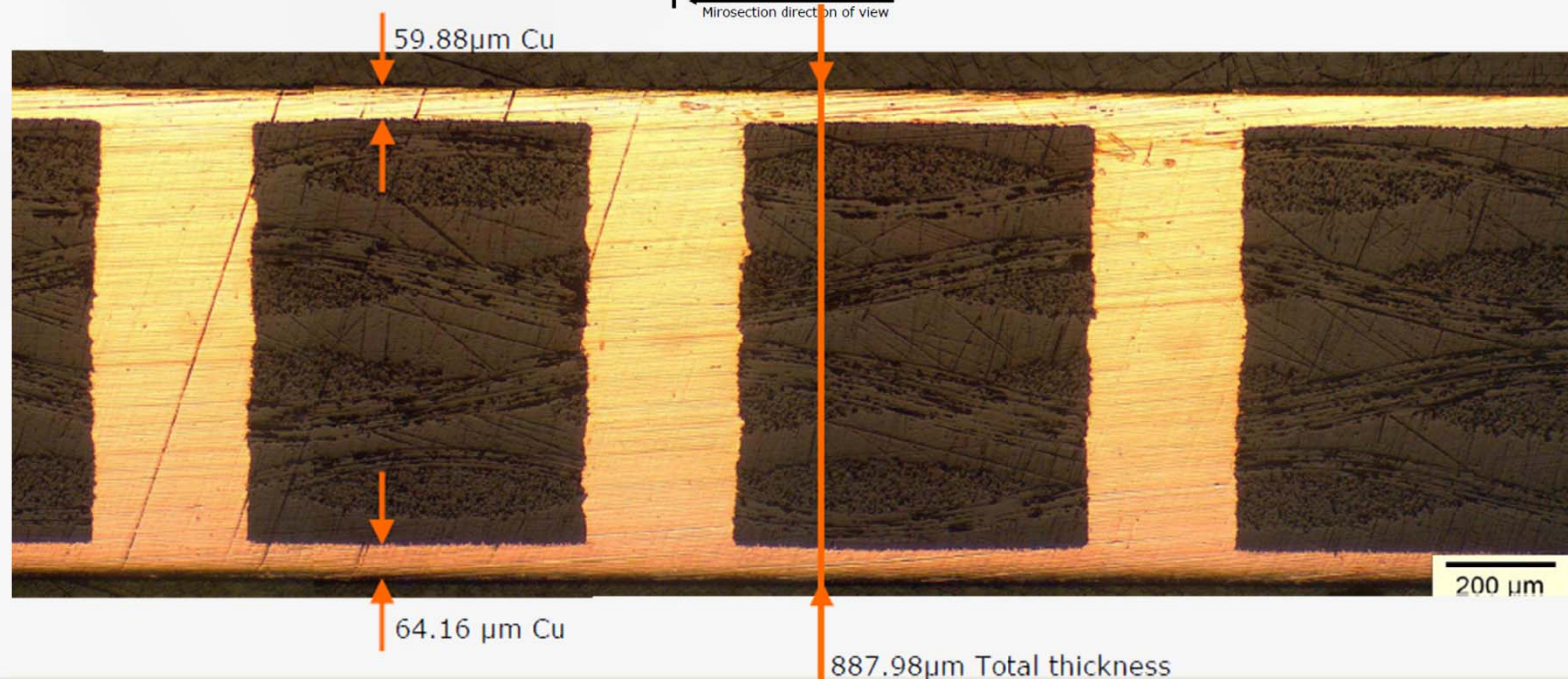
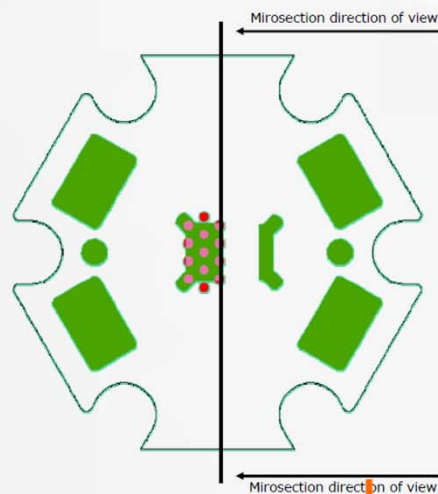
CYNER
SUBSTRATES

- Plasma desmear en juiste keuze flex materiaal essentieel !!!
- Filled and Capped soms noodzakelijk.



Cyner Led-Technologie

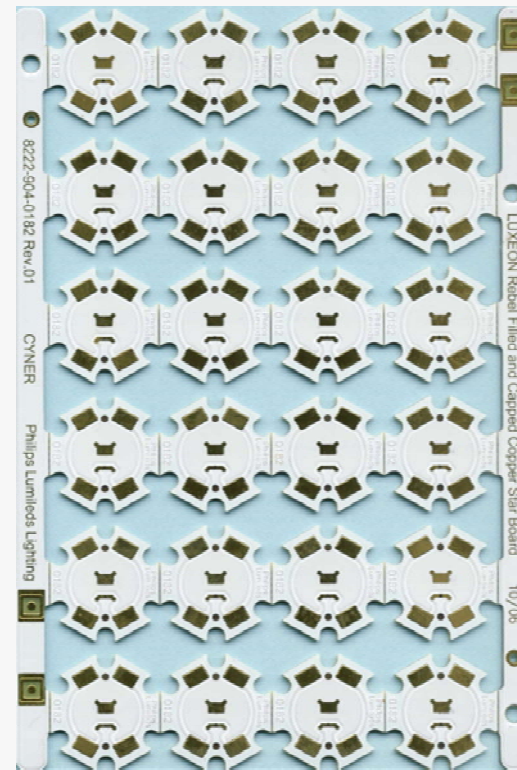
CYNER
SUBSTRATES



Cyner Led-Technologie

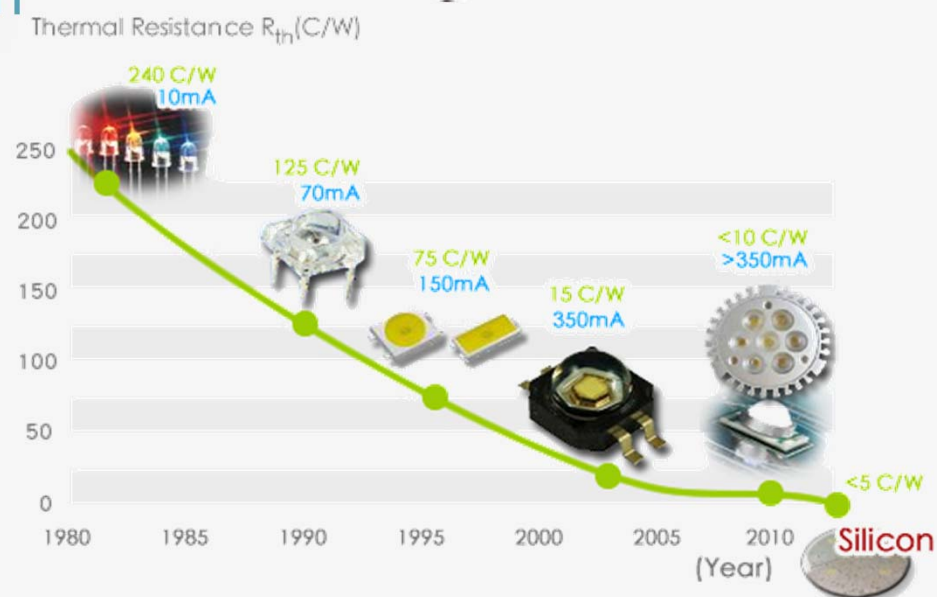
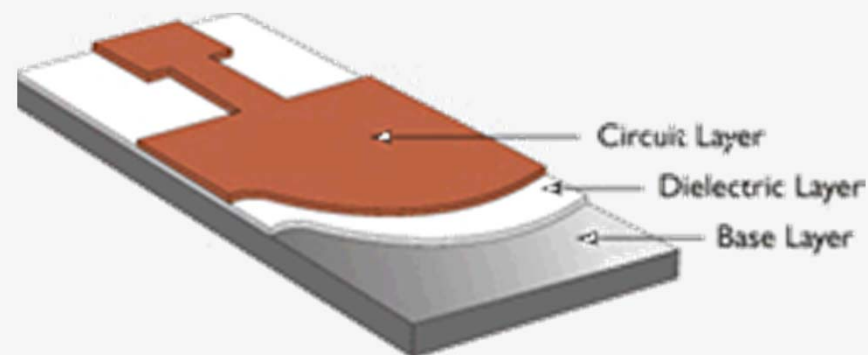
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Heatpipe Technology



Led-Technologie

- Thermische geleidbaarheid Thermo-mechanica
- MCPCB 1-3 W/mK
- Hybride 25 W/mK
- Koper 400 W/mK
- Thermische weerstand R_{th}
- 12 -2 C/W
- Standaard Fr4
- MCFlex

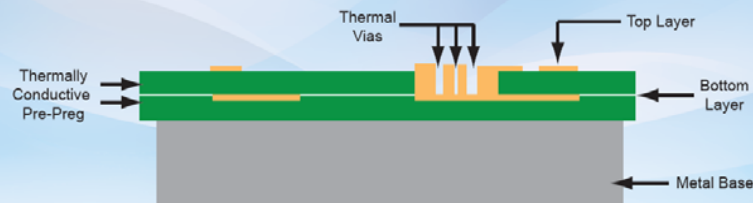


Mogelijkheden

CYNER
SUBSTRATES

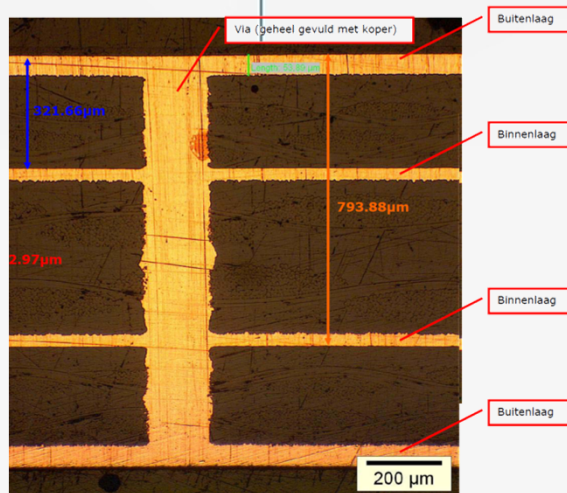
Two Layer Construction:

- Single side SMT with Metal Base
- Surface Mounting on Top Layer,
- All Connectivities Are Being Done on Layer 2
- More Room, More BOM, More Functions



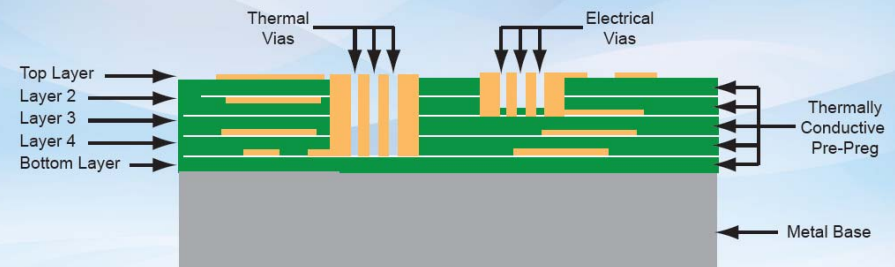
In combinatie met Thermal prepreg

Algemeen overzicht via



Four Layer Construction:

- Single side SMT with Metal Base
- Surface Mounting on Top Layer
- All Connectivities are being done on Layer 2 & 3. EMI on Layer 4
- Thermal Vias, Electrical Vias, Chassis Vias



Halogeenvrij

- Waarom Halogeenvrij (Rookontwikkeling, Giftige Gassen dus Brandveiligheid)
- TBBPA (**Tetrabroombisfenol A**) is de brandvertager voor printplaten
- RoHS 2 mogelijk verboden?
- Consumenten electronica
- Automotive
- Industriële electronica??



Halogeen vrij



Halide Free Definitions

Standard	Objective	Requirements
JPCA-ES-01-1999	Japan Printed Circuit Association (JPCA) defines criteria and method for "Halogen Free"	Br < 0.09wt% (900ppm) Cl < 0.09wt% (900ppm)
IEC 61249-2-21	International Electrotechnical Commission (IEC) finalized requirements	900 ppm max Cl 900 ppm max Br 1500 ppm max total halogens
IPC - 4101B	Has adopted the IEC definition of halogen free	900 ppm max Cl 900 ppm max Br 1500 ppm max total halogens

IEC Standard

Materials for printed boards and other interconnecting structures –

Part 2-21:

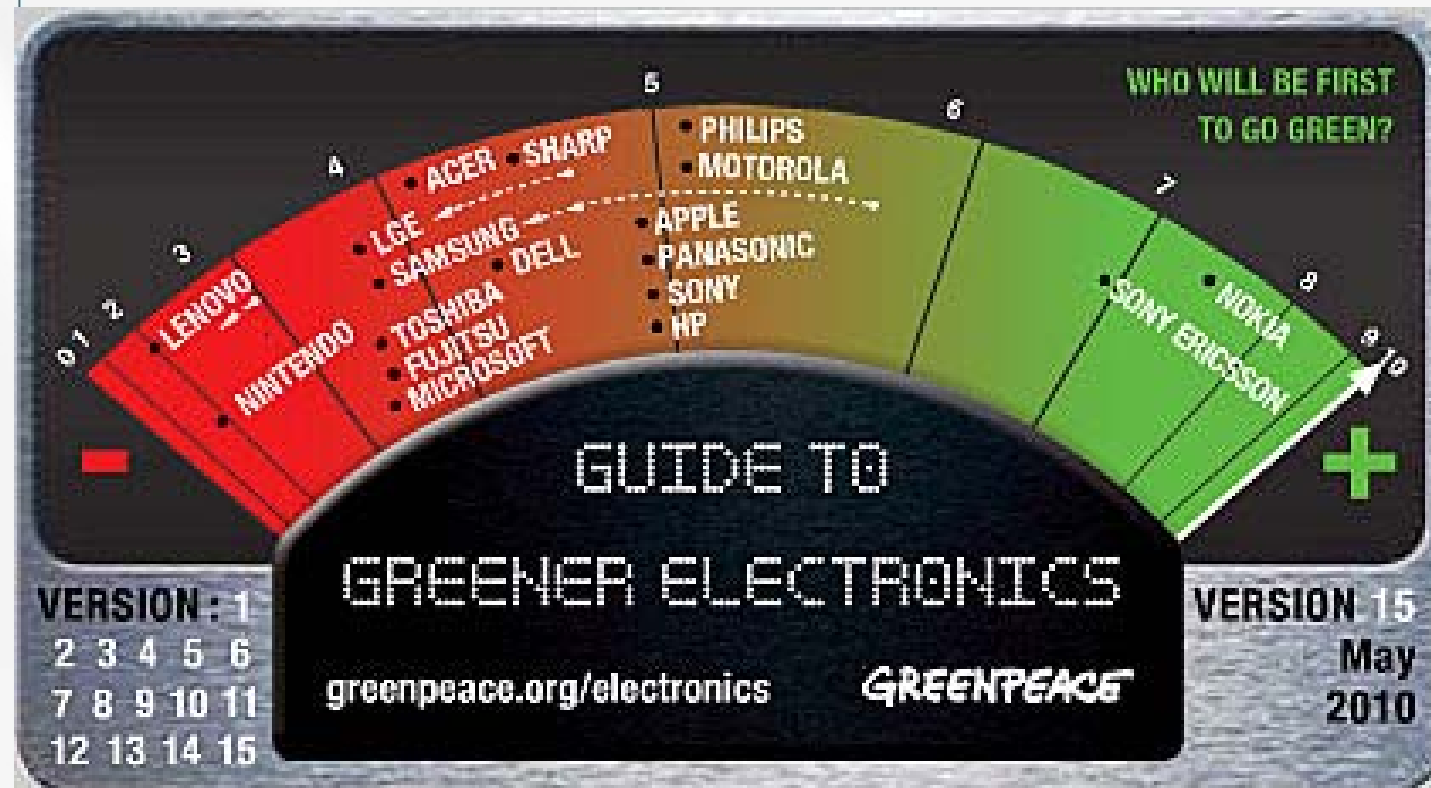
Reinforced base materials, clad and unclad –

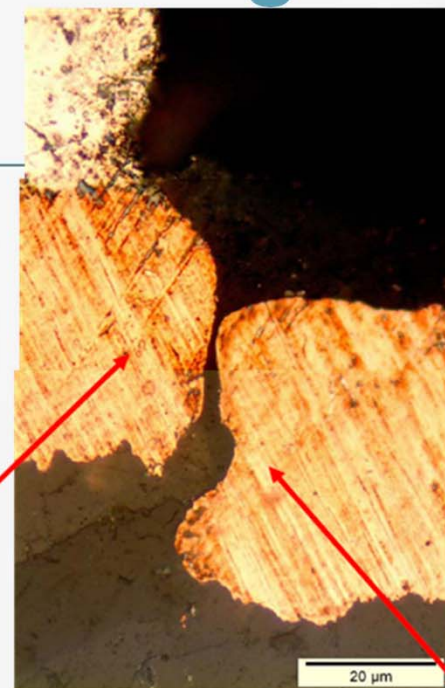
Non-halogenated epoxide woven E-glass reinforced laminated sheets of defined

flammability (vertical burning test), copper-clad

Halogeenvrij

CYNER
SUBSTRATES

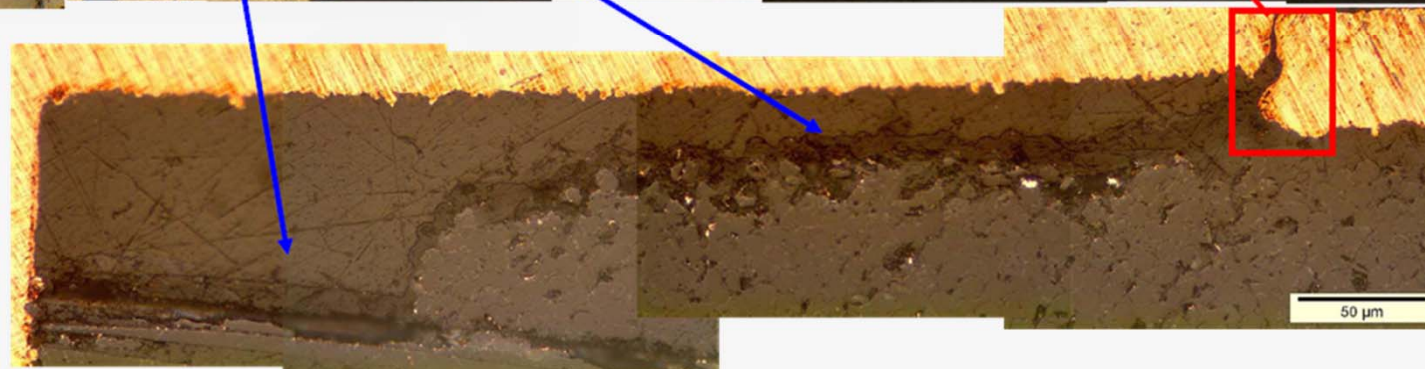




Soldering

20 μm

Detail 2:

50 μm

Pcb en MSL



- MSD Council (Moisture Sensitive Device Council)
- Heeft geadviseerd om PCB's als MSL klasse 4 te behandelen.
- Dit betekent maximaal 72h Floorlife

Table 1. IPC/JEDEC J-STD-20 MSL Classifications

	Floor Life		Soak Requirements			
			Standard		Accelerated	
Level	Time	Cond degC/%RH	Time (hrs)	Cond degC/%RH	Time (hrs)	Cond degC/%RH
1	unlimited	<=30/85%	168+5/-0	85/85	n/a	n/a
2	1 year	<=30/60%	168+5/-0	85/60	n/a	n/a
2a	4 weeks	<=30/60%	696+5/-0	30/60	120+1/-0	60/60
3	168 hours	<=30/60%	192+5/-0	30/60	40+1/-0	60/60
4	72 hours	<=30/60%	96+2/-0	30/60	20+0.5/-0	60/60
5	48 hours	<=30/60%	72+2/-0	30/60	15+0.5/-0	60/60
5a	24 hours	<=30/60%	48+2/-0	30/60	10+0.5/-0	60/60
6	TOL	<=30/60%	TOL	30/60	n/a	60/60

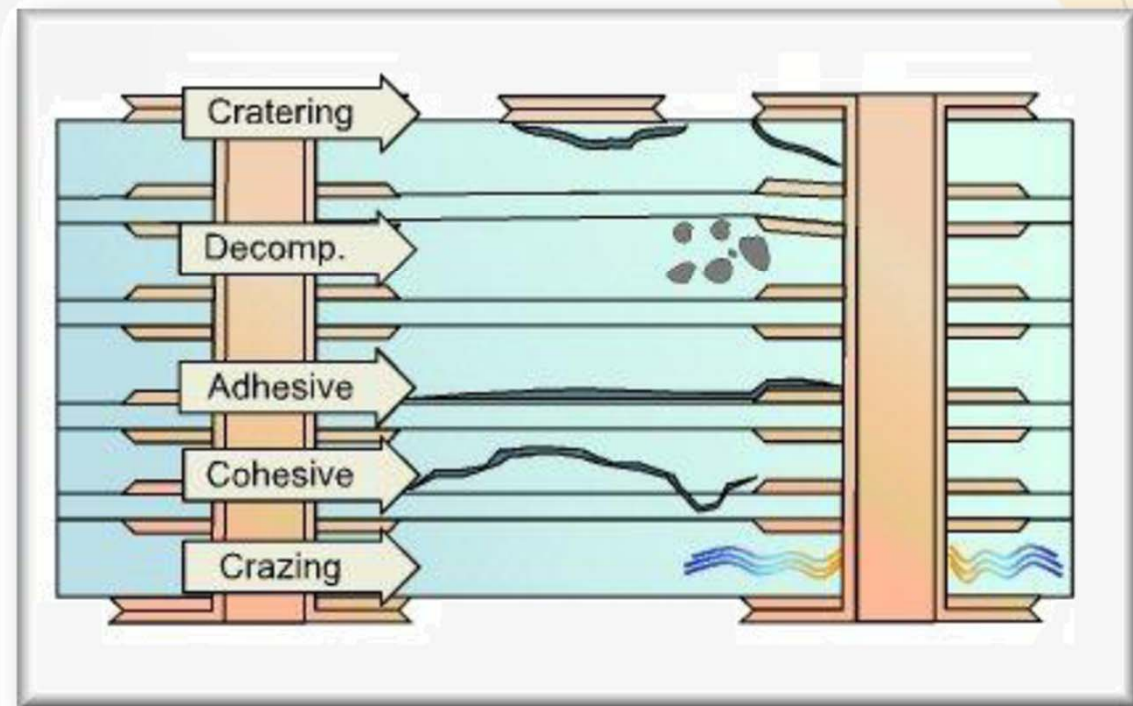
1) TOL means 'Time on Label', or the time indicated on the label of the packing.

Materiaal

- Meest bekende materiaal afwijkingen door vocht
- Measling
- Grazing
- Delaminatie



Material Damage



IPC- 1601



Samenvatting

- Vocht verlaagt de TG waarde
- Aanbevolen vochtpercentage voor verpakking.
- 0,1% gewicht voor processen tot 260°C (Loodvrij)
- 0,2% gewicht voor processen tot 230°C
- Droge printen produceren prefereert boven drogen voor verpakken.
- Testmethode ontwikkelen om verschillende ontwerpen, materialen en constructies te testen.



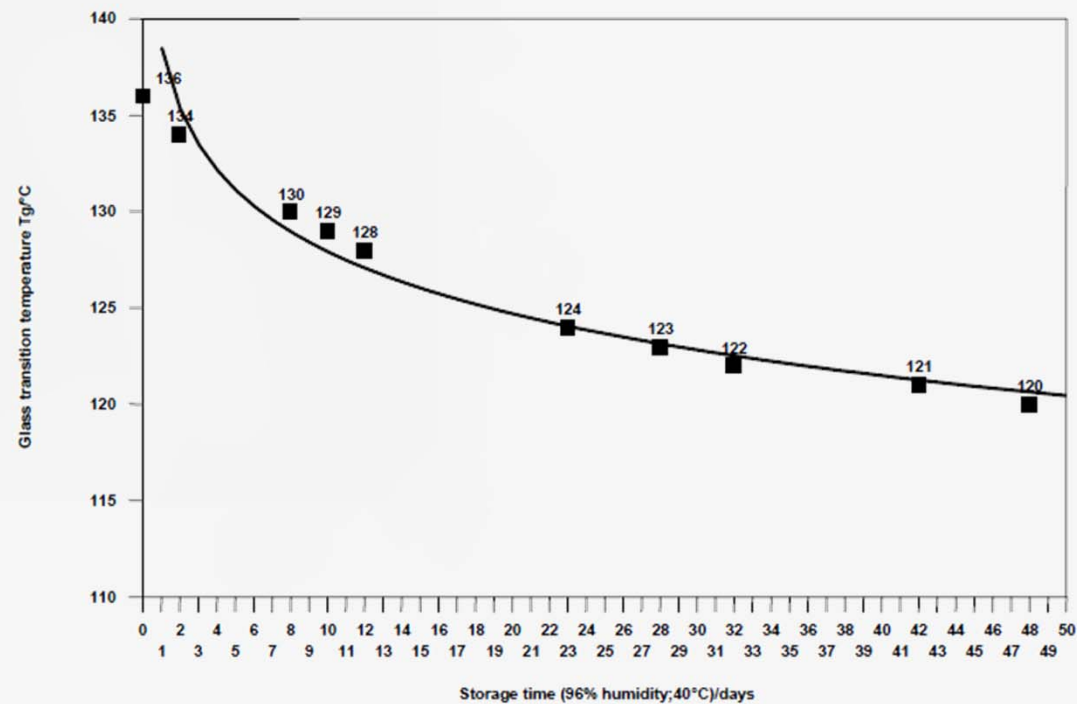
Materiaal

CYNER
SUBSTRATES



Influence of moisture on T_g

isola



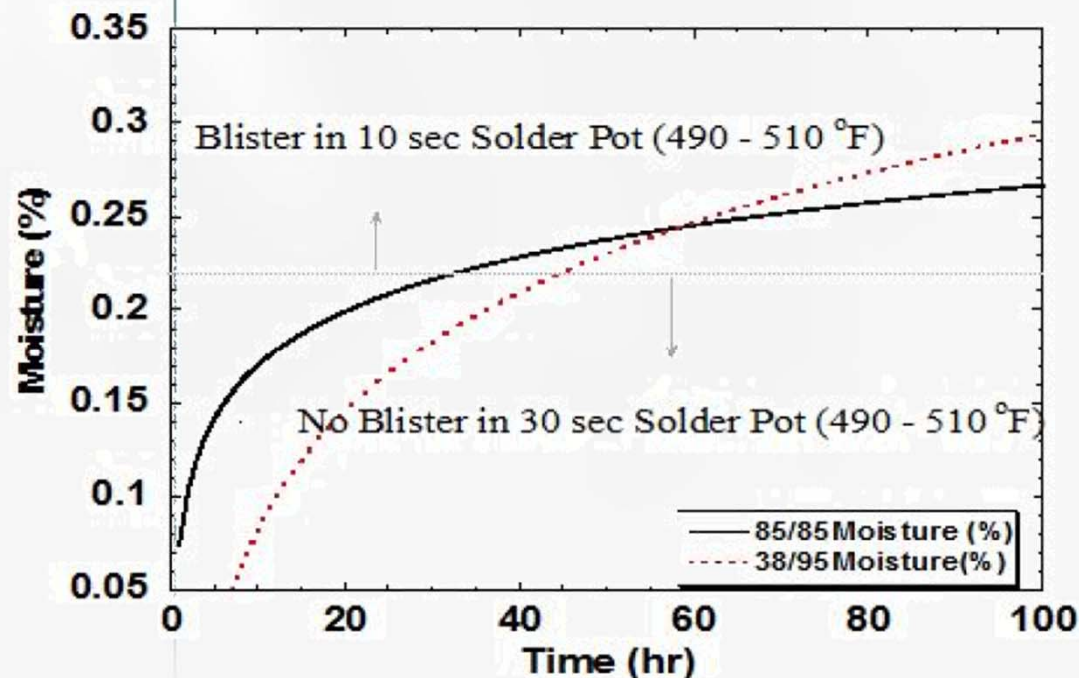
© 2008

www.isola-group.com

Wanneer gaat het fout

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- Onderzoek van Dr. Subhotash Khan van Dupont Heeft onderzoek gedaan op FR4 Multilayers.
- Boven de 0,22% ontstaan er problemen



IPC- 1601



- Moisture Barrier Bag
- Humidity Indicator Card
- Laminate witness card.
- Droog aanbevelingen



Table 5-1 Recommendations for Printed Board Baking Profiles

Final Finish	Temperature	Time	Comments
Tin	105 – 125 °C	4-6 Hours	Higher temperature may reduce solderability
Silver	105 – 125 °C	4-6 Hours	Silver may tarnish, but solderability should not be affected
Nickel/Gold	105 – 125 °C	4-6 Hours	No issue with extended bake on Nickel/Gold finish
Organic Coating	See 5.1.1		
HASL/HAL	105 – 125 °C	4-6 Hours	Final surface thickness below 30 μ m may turn into pure intermetallics and render the printed board unsolderable

IPC-5704

- Volgens IPC-6012 1,56µg/cm²
- Afgeleid van de Delphi C7000 Norm

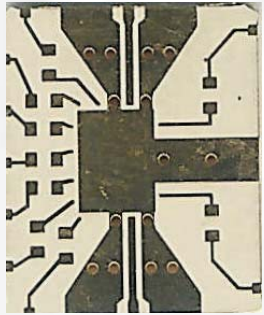


Table 4-1 Bare Printed Board Ionic Contamination Maximum Limits

Ions	Non-OSP	OSP
Chloride (Cl)	0.75 µg/cm ²	0.75 µg/cm ²
Bromide (Br)	1.0	1.0
Sodium (Na) + Potassium (K)	2.0	4.0
Total Inorganic	3.8	5.9

IPC

CYNER
SUBSTRATES



- IPC-1071 Intellectual Property
- IPC-2600 serie Documentatie voorschriften
- IPC-610E Nieuwste revisie keurings norm
- IPC-HDBK-830A Handboek Conformal Coating

- Partner in open innovatie. Majority Levels
- Antenne technieken
- Nano Finish

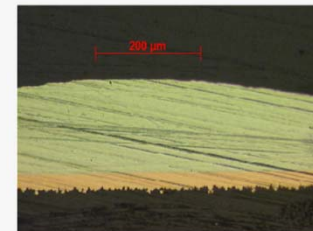


External Evaluation Results:
Micro Voids?

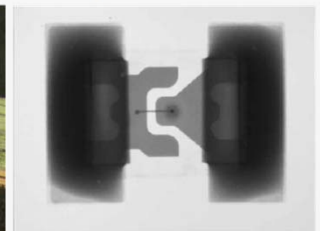


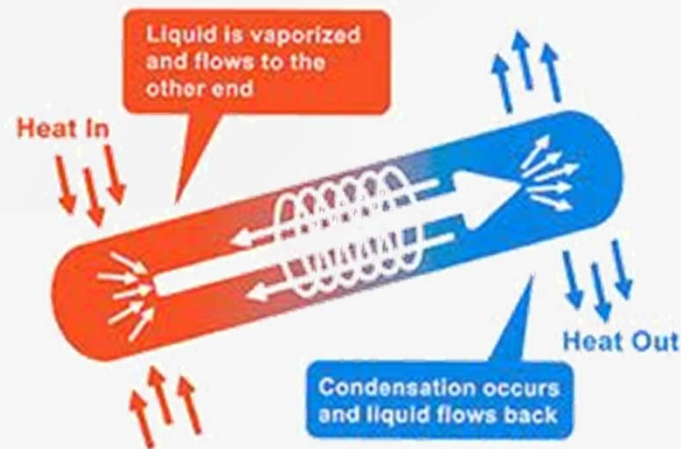
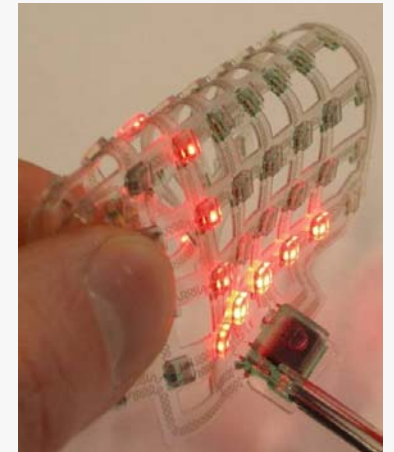
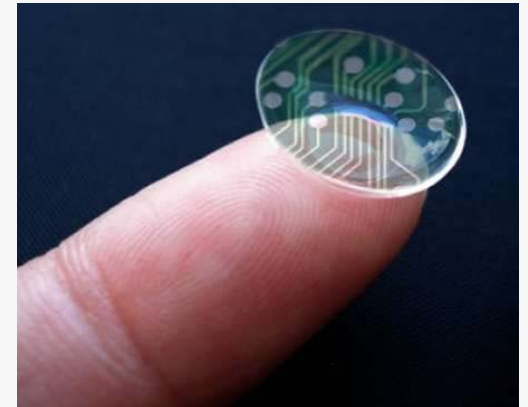
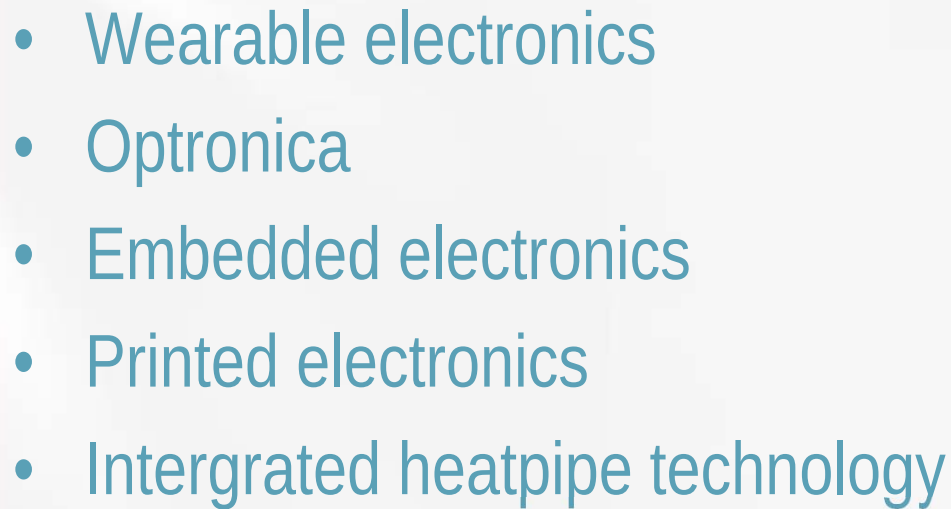
No Micro Voids
ISIT Fraunhofer Itzehoe

• No microvoids



• (x-ray) No microvoids





Einde

CYNER
SUBSTRATES

Cyner

Where know-how meets passion!!

