

Materials and Finishes

Materials	Product	Description	IPC 4101/4103
Arlon	25N	Low Loss Ceramic Filled Thermoset Resin	IPC-4103 /10
	33N	Polyimide	UL-94 V0
	35N	Polyimide	/40 /41
	37N	PrePreg, No-Flow Polyimide	/42
	55NT	Epoxy Thermount	/55
	85N	Bromine-free, High Operating Temp	/40 /41
	85NT	Polyimide Thermount	/53
	CuClad 250GX	Woven glass/PTFE composite	IPC-4103/02
	IsoClad 917	PTFE	/04
	51N	PrePreg Low-Flow Lead-Free	/124
	49N	PrePreg Low-Flow Lead-Free	/24
Dupont	Pyralux LG	PrePreg Low Flow	IPC-4203/17
Gore	SPEEDBOARD C	low Dk BT resin in toughening matrix	
Hitachi	MCL-E-679F(J)		/98 /99 /126
Isola	IS415	Lead free, Enhanced CAF, electrical performance	/24 (/21 /26 /28 /121 /124 /129)
	FR406	High Tg	/21 /24 /26
	FR406HR	Lead Free (No phenolics)	/21 /24 /26 /28 /121
	370HR	Lead free, Low CTE	/26 (/21 /24 /98 /99 /101 /126)
	GETEK	Low Dk Df, 175 C Tg, for High speed	/25
	A11	PrePreg, No-Flo, heat sink bonding, die cavity boards	/20
Nelco	N4000-6FC	Fast-Cure, High Tg	/24 /26 /28
	N4000-7	Low CTE	/24* /98
	N4000-7ef	165°C Tg Halogen-Free	/94
	N4000-29	Lead free, ROHS, High Tg FR4	/24 /26 /83 /98 /99 /126
	N4000-13	High Speed, Low Loss	/29
	N4000-13EP	Thermal reliability, CAF resistant, high speed low loss	/29
	N4000-13si	Signal Integrity, High Speed, Low Loss	/29
	N5000	BT Epoxy	/30
Nelcote	E-746	PrePreg, Service temperatures up to 500F	MIL-R-9300B Type II
Norplex-	NP511	Unclad G10	MIL-I-24768/3
Micarta			
Rogers	RT/duroid 5880	PTFE	IPC-4103/03/04
	6002	PTFE	
	4003C	Hydrocarbon Ceramic	IPC-4103 /10
	4230	Hydrocarbon Ceramic	
	4232	Halogen free, Antenna grade	
	4350B	Hydrocarbon Ceramic	IPC-4103 /11
	4403	Hydrocarbon Ceramic	



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4450B	Hydrocarbon Ceramic	IPC-4103 /11
4450F	Hydrocarbon Ceramic	IPC-4103 /11

Holefill	Product	Description	Type
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Taiyo	THP-100DX1	160 C Tg by TMA, CTE 32ppm by TMA	Non-conductive
San-Ei Kagaku	PHP-900 IR-10F	160 C Tg by TMA, CTE 32ppm by TMA	Non-conductive
Peters	PP 2795	>140 C Tg by TMA, CTE 40ppm	Non-conductive
	SD2361	Epoxy	Non-conductive
DuPont	CB100	91-93.5% solids (solvent based), Ag and Cu fillers	Conductive (electrically and thermally)
Sumitomo	X28075-2HT	Used to fill Aluminum and Copper cores	Non-conductive
Bakelite - Composite Materials			

Surface Finish	Thickness
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In-House	Hot Air Solder Level (HASL) coverage to 1.5 mils
	Electroless Ni Imm. Gold (ENIG) 120-250 uln Ni, 2-8 uln Au
	Hot Oil Reflow .3 to .5 mils plated
	IR Fused same
	Selective Solder Strip same
	Electrolytic Ni/Gold 200-400 uln Ni, 5-15 uln Au (30-50 uln for tabs)
	Electrolytic Hard Ni
	Carbon Ink Minico Ink
	Selective Finishes Typically a global solderable finish after a selective hard/soft gold finish has been applied.
Subcontract	Electroless Bondable Soft Au
	Electrolytic Gold (Soft) For wire bond typically 30-50µln on selective features. Gold has purity >99.9%, with 50-90 Knoop hardness.
	OSP .2 to .35 microns
	Immersion Silver 6-18 uln (15 uln nominal)
	Lead Free HASL

Soldermask	Product	Description	Type
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Taiyo	PSR-4000 HFX PSR-4000 MP P SR-4000 BN	Halogen-Free (except Red) Extremely Fast Photospeed Fine Dam Resolution Excellent Resistance to ENIG and Immersion Tin	LPI / LDI
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		<p>Available in Dark Green, Satin Finish RoHS Compliant and Lead-Free Compatible Excellent Solder Ball Resistance Resistance to No-Clean Flux Residue Available in Dark Green Matte and Satin and Black Matte Excellent Resistance to ENIG and Immersion Tin Hard Surface Finish Available in a Green or Dark Green Semi-Gloss High Viscosity Version for Better Edge Coverage on High Traces Best in Class for Small Hole Clearing Withstands ENIG and Immersion Tin Colors (Black, Blue, Clear, Red, White, and Yellow Semi-Gloss) For LDI and Conventional Exposing</p>	
	LDI-4000		LDI (US)
DuPont	Vacrel 8100	3 - 4 mils thick	Photopolymer Dry Film
Electra	EMP 110	Carapace Family, Green	LPI
Rohm&Haas	ConforMask 2500	IPC-SM-840B Class 3 and IPC-SM-840C Class T&H, MIL-P-55110D and Bellcore, High gloss	Photopolymer Dry Film
	Dynamask 5000	IPC SM840C Class T & H, Mil P55110D and Bellcore	Photopolymer Dry Film

Metal Cores	Product	Description	Type
Schlenk	CIC	Invar foil with copper plating and/or Cu/Zn-Treatment on both sides.	IPC-CF-152/2 CIC W X X
Bergquist Co	T-Clad	This is often aluminum, but other metals such as copper may also be used. The most widely used base material thickness is 0.062" (1.6mm) in aluminum, although many thicknesses are available.	
	Aluminum Cores		
	Copper Cores		
	Stainless Steel		



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Heatsinks	Product	Description	Type
	Copper Aluminum Laminate Composite Composite / Laminate / CuFilled / Milled		