

NELCO PCB MATERIALS *Product Selector Guide*



AGC Nelco develops and manufactures high-technology digital and RF / microwave printed circuit materials principally for the telecommunications and internet infrastructure, automotive and high-end computing markets. The Company's manufacturing facilities are located in Singapore, France, Arizona and California. The Company also maintains R&D facilities in Arizona and Singapore.

AGC Nelco provides a full range of prepreg and laminate PCB Materials providing superior thermal, mechanical and electrical performance in high layer count digital designs. AGC Nelco also manufactures a full line of RF / microwave materials.

All of AGC Nelcos electronic materials are RoHS compliant:

- New 5G substrate materials that operate into mmWave frequencies
- Materials for high-temperature lead-free assembly
- Modified epoxies/FR-4 for high temperature and increased reliability applications
- APPE, BT, polyimide, cyanate ester and PTFE substrates
- High speed / low loss materials for digital and RF applications
- Specialized RF / microwave substrate materials

AGC Nelco PCB Materials Products

FR-4 Substrates	Description	High Temp Lead-Free ²	CAF ³	Tg °C	Dielectric ¹ Constant (Dk)		Dissipation ¹ Factor (Df)
		Assembly Compatible	Resistant	(DSC)	1 MHz	1 GHz	1 MHz
N4000-6	High Tg Multifunctional Epoxy	-	-	175	4.3	4.1	0.023
N4000-6 FC	Fast-Cure, High Tg Multifunctional Epoxy	-	-	175	4.3	4.1	0.023
N4000-7	Low CTE Multifunctional Epoxy	Yes	Yes	155	4.5	4.0	0.018
N4000-7 SI®	Low CTE Multifunctional Epoxy	Yes	Yes	155	4.0	3.6	0.016
N4000-29	Lead Free, High Tg Multifunctional Epoxy	Yes	Yes	185	4.5	4.3	0.018

High Performance					1 GHz	10 GHz	10 GHz
Mercurywave® 9350	Microwave Performance, Very Low Loss, Modified Epoxy	Yes	-	200 (DMA)	-	3.5	0.004
Meteorwave® 1000	Very Low Loss, Very High Reliability	Yes	Yes	240 (DMA)	-	3.4	0.0047
Meteorwave® 2000	Ultra Low Loss, Very High Reliability	Yes	Yes	240 (DMA)	-	3.2	0.0034
Meteorwave® 3000	Very Low Loss, Very High Reliability	Yes	Yes	200 (DMA)	-	3.6	0.0039
Meteorwave® 4000	Ultra Low Loss, Very High Reliability	Yes	Yes	200 (DMA)	-	3.4	0.0024
Meteorwave® 3350	High Speed, Ultra Low Loss, Controlled Dk	Yes	Yes	200 (DMA)	-	3.5	0.0038
Meteorwave® 8000	Extreme Low Loss, Very High Reliability	Yes	Yes	185 (DMA)	-	3.28	0.0016
Meteorwave® 8350	Extreme Low Loss, Very High Reliability, Controlled Dk	Yes	Yes	185 (DMA)	-	3.5	0.0018
M-Ply™	Ultra Low Loss Bonding Ply	Yes	Yes	200 (DMA)	-	3.38	0.0020
N4000-12	High Speed, Low Loss, Modified Epoxy	Yes	Yes	190	3.7	3.6	0.008
N4000-12 SI®	High Speed, Low Loss, Modified Epoxy	Yes	Yes	190	3.4	3.3	0.007
N4000-13	High Speed, Low Loss, Modified Epoxy	Yes	Yes	210	3.7	3.6	0.008
N4000-13 SI®	High Speed, Low Loss, Modified Epoxy	Yes	Yes	210	3.4	3.2	0.007
N4000-13 EP™	High Speed, Low Loss, Modified Epoxy	Yes	Yes	210	3.7	3.6	0.008
N4000-13 EP SI®	High Speed, Low Loss, Modified Epoxy	Yes	Yes	210	3.4	3.2	0.007
N4350-13 RF	Microwave Performance, Modified Epoxy	Yes	-	210	-	3.5	0.008
N4380-13 RF	Microwave Performance, Modified Epoxy	Yes	-	210	-	3.8	0.008
N4800-20	Thermally Robust, High Speed, Low Loss, Mod. Epoxy	Yes	Yes	200	-	3.5	0.0074
N4800-20 SI®	Thermally Robust, High Speed, Low Loss, Mod. Epoxy	Yes	Yes	200	-	3.24	0.0064
N5000	BT Epoxy	Yes	Yes	185	3.6	3.6	0.010
N5000-30 & 32	Chip Packaging BT Epoxy (not available in Asia)	Yes	-	205 (DMA)	-	-	-
N7000-1	non-MDA Polyimide	Yes	-	260	3.9	3.8	0.0095
N7000-2 HT / -3	non-MDA Toughened Polyimide	Yes	-	260	3.5	3.5	0.009
N7000-2 V0	UL 94 V-0 Toughened Polyimide	Yes	-	250	3.8	3.8	0.010
N7000-3	UL 94 V-1 Toughened Polyimide	Yes	-	260	3.7	3.5	0.009
N8000	Cyanate Ester	Yes	-	250	3.6	3.5	0.007
N8000Q	Cyanate Ester with Quartz Fabric	Yes	-	250	3.3	3.2	0.006
N9000-13 RF	PTFE Blended Laminate	Yes	-	220	-	3.00-3.50	0.0040-0.0055
NH9000	Woven, Glass / Ceramic Loaded PTFE	Yes	-	-	-	2.94-4.50	0.0022-0.0030
NL9000	Woven, Glass-Reinforced PTFE	Yes	-	-	-	2.94-3.50	0.0017
NX9000	Woven, Glass-Reinforced PTFE	Yes	-	-	-	2.40-3.20	0.0016-0.0024
NY9000	Woven, Glass-Reinforced PTFE	Yes	-	-	-	2.08-2.33	0.0006-0.0011

No Flow Prepregs		Lead-Free ² Compatible	Tg °C (DSC)	Dk 1 GHz	Dk 10 GHz	Df 1 GHz	Df 10 GHz
N4000-6NF	Fast-Cure, High Tg Multifunctional Epoxy No Flow	-	175	4.1	-	-	-
N4000-29NF	Lead Free, High Tg Multifunctional Epoxy No Flow	Yes	185	4.3	4.0	-	0.017
Meteorwave 1000NF	Very Low Loss, Very High Reliability No Flow	Yes	240 (DMA)	-	3.4	-	0.0047

¹ Dk and Df numbers provided are typical values. RF/Microwave material Dk and Df values are based on actual constructions.

² High-temperature lead free assembly compatibility is based on Td, T₂₆₀ and 245°C / 260°C reflow testing. Actual results will vary based on assembly and board construction conditions.

³ CAF resistance testing is based on specific coupon design and test protocols.

All test data provided are typical values and not intended to be specification values. For review of critical specification tolerances, please contact a company representative directly.