



Nelco Materials Selection Guide

Park Electrochemical Corp. offers a diverse portfolio of advanced substrates under the Nelco® name. Materials include those suitable for lead-free assemblies, modified epoxies for high temperature and increased reliability applications, high speed/low loss materials for digital applications requiring increased signal integrity, and BT, polyimide, cyanate ester and specialized RF/Microwave dielectric substrates that operate at frequencies up to 77 GHz. All Nelco materials are RoHS compliant.

FR-4 Epoxies	Description	Lead-Free** Assembly Compatible	CAF** Resistant	T _g (DSC) °C	Dielectric* Constant (Dk)		Dissipation*
					1 MHz	1 GHz	Factor (Df) 1 MHz
N4000-2	Multifunctional Epoxy	-	-	140	4.3	4.1	0.023
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
N4000-6 FC BC®	Buried Capacitance™, High Tg Epoxy	-	-	175	3.8	3.6	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
N4000-7 EF®	165°C Tg Halogen-Free Epoxy	Yes	Yes	165	4.1	4.0	0.013
N4000-11	Low CTE, High Tg Multifunctional Epoxy	Yes	Yes	175	4.3	4.1	0.012
N4000-11 BC®	Buried Capacitance™, Low CTE, High Tg Epoxy	Yes	Yes	175	3.7	3.5	0.016
N4000-29	Lead Free, High Tg Multifunctional Epoxy	Yes	Yes	185	4.5	4.3	0.016
N4000-29 BC®	Buried Capacitance™, Lead Free, High Tg Epoxy	Yes	Yes	185	4.5	4.3	0.022
High Performance					1 GHz	10 GHz	10 GHz
N4000-12	High Speed, Low Loss, CAF Resistant System	Yes	Yes	190	3.7	3.6	0.008
N4000-12 SI®	High Speed, Low Loss, CAF Resistant System	Yes	Yes	190	3.4	3.3	0.007
N4000-13	High Speed, Low Loss Epoxy	Yes	Yes	210	3.7	3.6	0.008
N4000-13 BC®	Buried Capacitance™, High Speed, Low Loss	Yes	Yes	210	3.5	3.3	0.008
N4000-13 SI®	High Speed, Low Loss Epoxy	Yes	Yes	210	3.2	3.2	0.007
N4350-13 RF	Microwave Performance, Modified Epoxy	Yes	-	210	-	3.5	0.0065
N4380-13 RF	Microwave Performance, Modified Epoxy	Yes	-	210	-	3.8	0.007
N5000	BT Epoxy	Yes	Yes	185	3.6	3.6	0.014
N5000-30 & 32	Chip Packaging BT Epoxy (not available in Asia)	Yes	-	205	-	-	-
N7000-1	non-MDA Polyimide	Yes	-	260	3.9	3.8	0.016
N7000-2 HT /-3	non-MDA Toughened Polyimide	Yes	-	260	3.5	3.5	0.015
N7000-2 V0	UL 94 V-0Toughened Polyimide	Yes	-	250	3.8	3.8	0.010
N8000	Cyanate Ester	Yes	-	250	3.6	3.5	0.011
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
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

*Dk and Df numbers provided are typical values calculated at a 50% resin content except where noted. BC material values are provided for a standard construction (approximately 70% resin content). Microwave material values are controlled and not listed by resin content.

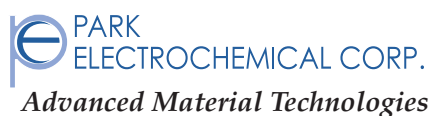
**CAF resistance and lead-free compatibility has been established to the specified hours using a specific test procedure. Testing is ongoing and results are currently available for only a limited number of products. For details on this or other material testing, please visit www.parkellectro.com or contact your local Nelco representative.

Park Electrochemical Corp. is a global advanced materials company which develops and manufactures high-technology digital and RF/microwave printed circuit materials and advanced composite materials. The company operates under the Nelco® and Nelcote™ names.

All test data provided are typical values and not intended to be specification values. For review of critical specification tolerances, please contact a Nelco representative directly. Nelco reserves the right to change these typical values as a natural process of refining our testing equipment and techniques. Nelco does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights nor the rights of others. This disclaimer of warranty is in lieu of all warranties whether expressed, implied or statutory, including implied warranties of merchantability or fitness for a particular purpose.

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