NaF2000 Series

Features of NaF2000 Series

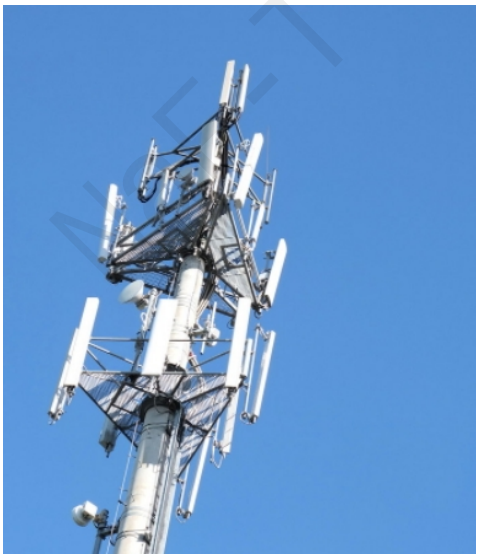
- NaF2000 series are ceramic-filled PTFE high-frequency copper clad laminates (CCLs) independently developed and produced by NaF-T.
- The dielectric constant is very stable and the dielectric loss is ultra low (D_k: 2.2~2.95; D_f: 0.0008~0.0023).

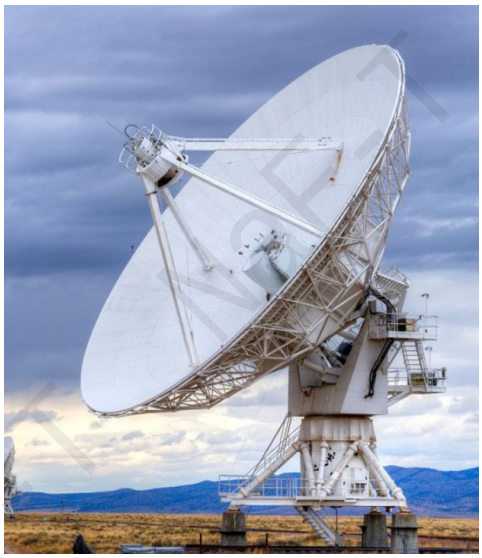
- **Consistent and stable**
- **High peel strength**
- **Low dielectric loss**
- **Excellent cost performance**

Application Fields of NaF2000 Series

- The products are used in radar antenna, microwave transmission, GPS navigation, communication, etc.
- NaF-T not only produces high-frequency copper clad laminates (CCLs) with ultra low loss, but also can customize the thickness and thermal conductivity of CCLs according to customer's needs.

- **Radar antenna**
- **Microwave transmission**
- **GPS navigation**
- **Communication apparatus**





NaF2022: A PTFE RF Circuit Material with Ceramic filling

GENERAL PROPERTIES

Property	Typical Value	Direction	Unit	Condition	Test Method
Dielectric Constant, D_k	2.2±0.02	Z	-	10 GHz 23℃	IPC-TM-650 2.5.5.5 SPDR
Dissipation Factor, D_f	0.0009	Z	-	10 GHz 23℃	IPC-TM-650 2.5.5.5
Thermal Coefficient of ε_r	-150	Z	ppm/℃	10 GHz 0-100℃	IPC-TM-650 2.5.5.5
Dimensional Stability	-0.05, -0.06	X, Y	mm/m	COND A	IPC-TM-650 2.2.4
Volume Resistivity	10^8		MΩ•cm	COND A	IPC 2.5.17.1
Surface Resistivity	10^7		MΩ	COND A	IPC 2.5.17.1
Tensile Modulus	4000 3500	MD CMD	MPa	23℃	ASTM D638
Water Absorption	0.04	-	%	D 48/50	IPC-TM-650 2.6.2.1
Thermal Conductivity	0.45	-	W/(m·K)	50℃	ASTM D5470
Coefficient of Thermal Expansion	50, 43, 250	X , Y , Z	ppm/℃	23℃/50% RH (23 ~ 150℃)	IPC-TM-650 2.4.24
T_d	500		℃	TGA	ASTM D3850
Density	2.1		mg /cm^3		
Copper Peel Strength	12.0		pli	1 oz. EDC After floating tin	IPC-TM-2.4.8
Flammability	V-0				UL 94
Lead Free Process Compatible	YES				

PRODUCT SPECIFICATION

Standard Thickness	Standard Panel Size	Standard Copper Cladding
0.020" (0.508mm) +/- 0.0020" 0.030" (0.762mm) +/- 0.0030" 0.060" (1.016mm) +/- 0.0030" * Other thicknesses are available	12" X 18" (305 X 457mm) 24" X 18" (610 X 457mm)	electrolytic copper foil:LP/VLP/RTF/HVLP ½ oz.(18μm) H/H 1 oz.(35μm) 1/1 * Additional cladding weights are available

Note: All typical values listed above are for reference only and not for specification.