

Materials and Metallization

Compex utilizes an extensive variety of materials in both Class I and Class II categories with dielectric constants ranging from 3.8 to 35,000 to fabricate our components. Other dielectric materials are available; please consult our factory.

Class I Dielectric Materials: This class of dielectrics consists of material exhibiting very low losses, extremely low or closely controlled temperature coefficients, negligible voltage and frequency coefficients, negligible aging effects, and high insulation and dielectric breakdown.

Type	Ins. Res. (MEG-OHMS 100VDC @ 25°C)	Temperature Coefficient PPM/°C -55 to 125°C	Dissipation Factor (@ 10GHz)	Dielectric Constant (K)	Material
C-20	10 ⁶	Negligible	0.0001	3.8	Quartz
C-22	10 ⁶	Negligible	0.0001	3.9 (SiO ₂)	Si
C-25*	10 ⁶	Negligible	0.0001	6.6	BeO
C-28*	10 ⁶	P120 ±25	0.0001	8.7	AlN
C-30	10 ⁶	P180 ±50	0.0006	9.6	Alumina 96
C-35*	10 ⁶	P180 ±50	0.0006	9.8	Alumina 99.6
C-37	10 ⁶	NPO 0±30	0.0001	12.6	Titanate
C-40	10 ⁶	0 ±30	0.0010	20	Titanate
C-50	10 ⁶	0 ±30	0.0020	40	Titanate
C-55	10 ⁶	0 ±30	0.0050	50	Titanate
C-58	10 ⁴	0 ±30	0.0050	84	Titanate
C-70	10 ⁶	N1500 ±400	0.0025	150	Titanate

*Typically used for submounts and substrates only.

Class II Dielectric Materials: This class of material is characterized by high dielectric constants, increased losses, and higher temperature coefficients. These properties are inherent with this class of material but the high dielectric constants permit the use of smaller size to achieve low series inductance and meet dimensional requirements. Capacitors made with these materials are often used for coupling of microstrip line circuits where the small chip size is necessary. Used as bypass capacitors, the small size provides low series inductance and dielectric losses are typically of little concern.

Type	Ins. Res. (MEG-OHMS 100VDC @ 25°C)	Temperature Coefficient (%) -55 to 125°C	Dissipation Factor (@ 1MHz)	Aging (%) HR/ Decade	Dielectric Constant (K)
C-80	10 ⁵	5 to -10	0.010	2.0	300
C-90	10 ⁵	10 to -10	0.015	3.0	1,100
C-100	10 ⁵	3 to -10	0.015	3.5	2,200
C-120	10 ⁵	0 to -35	0.020	3.0	4,000
C-130	10 ⁵	0 to -60	0.025	3.0	5,000
C-140	10 ⁵	0 to -80	0.025	3.0	11,000
C-200	*	15 to -15	0.035	3.0	25,000
NEW C-400	*	15 to -15	0.035	3.0	35,000

* Please consult the factory for specific ratings to meet your application requirements

New Material

C-400: Ultra High K X7R material. Capacitance change ±15% from -55 to 125°C. 200pF in a 10 x 10 size. 1,000pF in a 25 x 25 size.

Substrates can be supplied as follows:

- **Bare**
- **Metallized**
 - gold over platinum, palladium, or nickel
 - silver over platinum
 - custom schemes and patterns to customer specifications
- **Thickness range:**
3 mils and up
- **Length and Width:**
up to 4" depending on material

Standard Electrode Metallizations

Gold (G): This metallization consists of a minimum of 70 micro-inches of gold over non-magnetic leach-resistant nickel or platinum which is ideal for all wirebonding methodologies. Please consult our factory for optimum metallization options for solder applications.

Silver (S): This metallization consists of 20 micro-inches of silver over platinum which is ideal for all solder applications whenever the use of gold is unacceptable.