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Core Materials

When selecting PICONICS microelectronic inductors and transformers, another important parameter which should be specified is the core material. A change in core material can change virtually all of the electrical properties of the inductor with the exception of its DC resistance. This is why PICONICS offers the greatest possible selection of core materials; it is possible to change the tuning range, Q, temperature characteristics, and long term stability. There are two general categories of core materials: Ferrite is a ceramic and consists mainly of iron oxide and their metallic oxides. Powdered iron is an epoxy loaded with iron particles. Ferrite is mechanically stronger than powdered iron but has poorer temperature stability. Powdered iron has lower permeability but has greater temperature stability. Each of the materials which we offer has certain advantages.

Core	Material	Tuning Range		Stability	Optimum Q at freq. MHz	Freq. Used MHz
		Range Max, Typ	Comments			
1F	Ferrite	14:1, 4:1	Largest tuning range	Poorest stability +500+/-150ppm/C	1	0.1-5
3F	Ferrite	6:1, 3.5:1	2nd largest tuning range	than powdered iron +85+/-25ppm/C	5	2-10
3I	Powdered Iron	3:1, 1.8:1	Largest tuning range	Fair stability +100+/-100ppm/C	5	2-10
6I	Powdered Iron	1.5:1	Medium tuning range	Most stable material +65+/-25ppm/C	10	10-30
8F	Ferrite	4:1, 2:1	Medium tuning range	Poor stability+700+/-100ppm/C	10	10-30
7I	Powdered Iron	1.4:1	Small tuning range	Medium stability +95+/-20ppm/C	50	30-50
8I	Powdered Iron	1.2:1	Smallest tuning range	Medium stability +100+/-50ppm/C	80	50-200