SECTION II: FERRITE CORES

Ferrite Cores are available in numerous sizes and several permeabilities. Their permeability range is from 20 to more than 15,000. They are very useful for resonant circuit applications as well as wideband transformers and they are also commonly used for RFI attenuation. We can supply sizes from 0.23 inches to 2.4 inches in outer diameter directly from stock.

Ferrite toroidal cores are well suited for a variety of RF circuit applications and their relatively high permeability factors make them especially useful for high inductance values with a minimum number of turns, resulting in smaller component size.

There are two basic ferrite material groups: (1) Those having a permeability range from 20 to 800 μ_i are of the Nickel Zinc class, and (2) those having permeabilities above 800 μ_i are usually of the Manganese Zinc class.

The Nickel Zinc ferrite cores exhibit high volume resistivity, moderate temperature stability and high 'Q' factors for the 500 KHz to 100 MHz frequency range. They are well suited for low power, high inductance resonant circuits. Their low permeability factors make them useful for wide band transformer applications as well.

The Manganese Zinc ferrites, having permeabilities above 800 μ_i, have fairly low volume resistivity and moderate saturation flux density. They can offer high 'Q' factors for the 1 KHz to 1 MHz frequency range. Cores from this group of materials are widely used for switched mode power conversion transformers operating in the 20 KHz to 100 KHz frequency range. These cores are also very useful for the attenuation of unwanted RF noise signals in the frequency range of 20 MHz to 400 MHz and above.

A list of Ferrite toroids, including physical dimensions, A_L values, and magnetic properties will be found on the next few pages. Use the given A_L value and the equation below to calculate a turn count for a specific inductance.

$$N = 1000\sqrt{\frac{\text{desired 'L' (mh)}}{A_L \text{ (mh/1000 turns)}}} \qquad L(\text{mh}) = \frac{A_L \times N^2}{1{,}000{,}000} \qquad A_L(\text{mh/1000 turns}) = \frac{1{,}000{,}000 \times \text{'L' (mh)}}{N^2}$$

N = number of turns L = inductance (mh) A_L = inductance index (mh)/1000 turns)

To improve voltage breakdown, coatings of ferrite cores are available for the F, J, W and H materials. Typical coatings are parylene C, Gray Coating and Black Lacquer. Parylene C coating has a thickness of 0.5 mils to 2 mils with a voltage breakdown of 750V. Gray coating has a thickness of 4 mils to 8 mils with voltage breakdown of 500V. Black Lacquer coating has a thickness of 0.5 mils to 2 mils with no increase in voltage breakdown.

All items in this booklet are standard stock items and usually can be shipped immediately. Call for availability of non-stock items.

- **For standard stocking items of Inductors, Chokes, Transformers and other wound ferrites, please see section V.**
- **For custom design of Inductors, Chokes, Transformers or Special Coil Windings, please call or fax your specifications today.**
- **Amidon provides engineering designs, prototyping and manufacturing. Low to high volume production capability with the most competitive pricing.**