Glossary of Terms

Ferronics soft ferrite products are made from both manganese-zinc and nickel-zinc materials, with a wide range of capabilities. The glossary of terms below defines the salient characteristics used to describe the various materials, and the Material Properties Table defines the parameters of each of Ferronics' seven materials.

The following pages provide some representative material curves further defining the characteristics of the various materials. Ferronics B,T and V materials (MnZn) are primarily used for frequencies below 2 MHz, and offer high initial permeability, low losses, and high saturation flux density. The rest of Ferronics' materials, e.g., G, J, K, & P (all NiZn) provide high resistivity, and operate in a range from 1 MHz to several hundred MHz.

Amplitude Permeability, μ_a. The quotient of the peak value of flux density and peak value of applied field strength at a stated amplitude of either, with no static field present.

Coercive Force, H_c (A/*m*).The magnetizing field strength required to bring the magnetic flux density of a magnetized material to zero.

Curie Temperature, T_c (°C).The transition temperature above which a ferrite loses its ferrimagnetic properties.

Effective Dimensions of a Magnetic Circuit, Area A_e (cm^2), Path Length le(cm), and Volume V_e (cm^3). For a magnetic core of given geometry, the magnetic path length, the cross sectional area and the volume that a hypothetical toroidal core of the same material properties should possess to be the magnetic equivalent to the given core.

Effective Permeability, μ_e. For a magnetic circuit constructed with an air gap or air gaps, the permeability of a hypothetical homogeneous material which would provide the same reluctance.

Field Strength, H (A/m). The parameter characterizing the amplitude of alternating field strength.

Flux Density, B (Tesla). The corresponding parameter for the induced magnetic field in an area perpendicular to the flux path.

Incremental Permeability, $\mu\Delta$. Under stated conditions the permeability obtained from the ratio of the flux density and the applied field strength of an alternating field and a super-imposed static field.

Inductance Factor, A_L (nH). Inductance of a coil on a specified core divided by the square of the number of turns. (Unless otherwise specified, the inductance test conditions for inductance factor are at a flux density 1mT).

Initial Permeability, μ_i. The permeability obtained from the ratio of the flux density, kept at 1*m*T, and the required applied field strength. Material initially in a specified neutralized state.

Loss Factor, tan δ/μ_i. The phase displacement between the fundamental components of the flux density and the field strength divided by the initial permeability.

Magnetically Soft Material. A magnetic material with a low coercivity.

Magnetic Hysteresis. In a magnetic material, the irreversible variation of the flux density or magnetization which is associated with the change of magnetic field strength and is independent of the rate of change.

Power Loss Density, P (mW/cm^3). The power absorbed by a body of ferromagnetic material and dissipated as heat, when the body is subjected to an alternating field which results in a measurable temperature rise. The total loss is divided by the volume of the body.

Remanence, B_r (Tesla). The flux density remaining in a magnetic material when the applied magnetic field strength is reduced to zero.

Saturation Flux Density, B_s (Tesla). The maximum intrinsic induction possible in a material.