

Basic Understanding on Soft Ferrite Cores by Speedofer Components

Ferrite core: Ferrite cores are homogeneous ceramic structures made by powder metal composition by mixing Iron Oxides (Fe_2O_3) with oxides or carbonates of one or more metals such as Manganese (Mn), Zinc (Zn), Nickel (Ni) and Magnesium (Mg).

Classified standard shapes of ferrite cores: Post composition, these are pressed into the different shapes named as Drum, EC, EDR, EE, EER, EFD, EI, ELP, EP, EPC, EPX, ER, ET, ETD, EV, FOC, I, Planer, Pot, PQ, Ring, RM, UT, UU & etc geometries. Post pressing, these are sintered or fired in kiln or furnace at 1200°C to 1600°C with respect to the manufacturing aspects and the material characteristics needed.

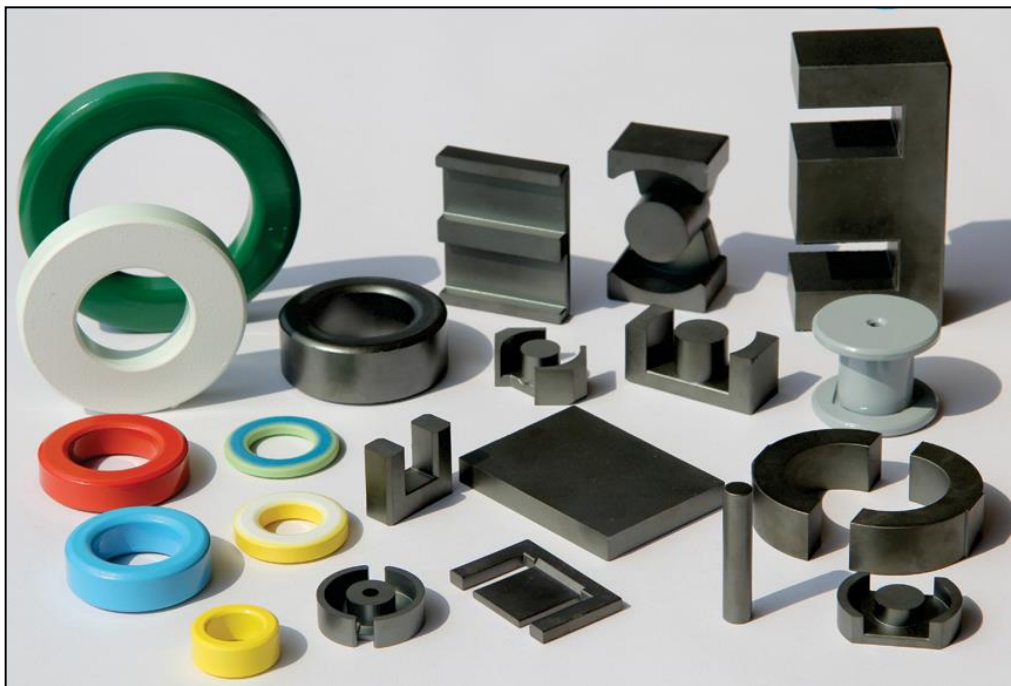
Soft ferrite cores: They have a low coercivity and are called "*soft ferrites*" to distinguish them from "*hard ferrites*", which have a high coercivity and are used to make ferrite magnets. **Coercivity:** When a ferromagnetic material is magnetized in one direction, it will not relax back to zero magnetization when the imposed magnetizing field is removed. The amount of magnetization it retains at zero driving field is called its remanence. It must be driven back to zero by a field in the opposite direction; the amount of reverse driving field required to demagnetize is called its coercivity.

Ferrite core applications: Soft ferrite cores are used in making Transformers, Inductors, Chokes and Ferrite Beads that apply in powering and / or driving any electronics printed circuit board assemblies. Soft ferrites cores also have application space in Consumer Electronics, CFL, LED Lighting, Conventional Lighting, SMPS, Power Electronics, Renewable Energy, Electrical Power Distribution, Telecommunications, Security Systems, Data Centres and Special Applications Industry segments. As ferrites have an advantage of high electrical resistivity and low eddy current losses over a wide frequency range, this high electrical resistivity characteristic, along with high permeability, make ferrite material an ideal for usage in the applications such as high frequency transformers, wide band transformers and adjustable inductors operating in varying from 10 kHz to 50 MHz frequency range.


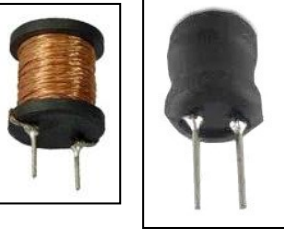


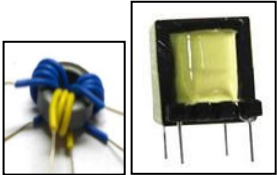

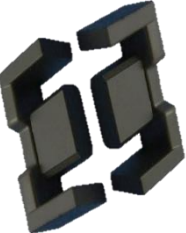
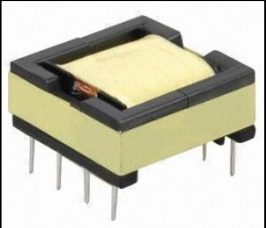

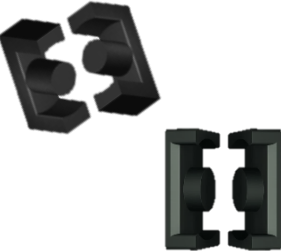


What is the difference between Nickel-Zinc (NiZn) and Manganese-Zinc (MnZn) ferrites?

MnZn ferrite materials have high permeability, while NiZn ferrite materials have low permeability. MnZn ferrites are used in applications where the operating frequency is less than 5 MHz and NiZn ferrites have a higher resistivity and are used at frequencies from 2 MHz to a several hundred MHz. The exception is common mode inductors where the impedance of MnZn material makes it the best choice up to 70 MHz and NiZn is recommended from 70 MHz to several hundred GHz.

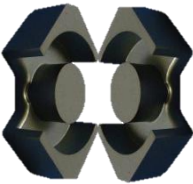
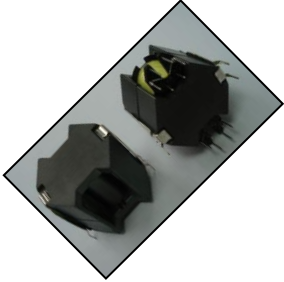
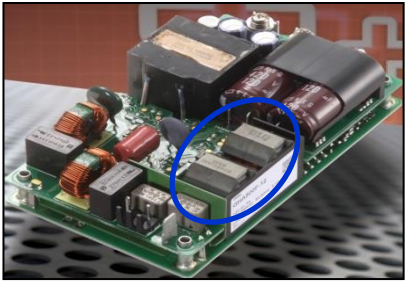






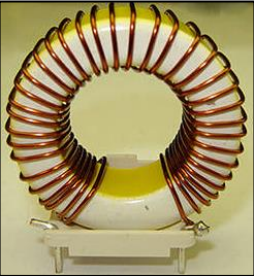

Ferrite cores picture followed by even more application details:



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Ferrite Core	Component Assembly	PCB Assembly	Final Product	Application Remarks
				<p>Drum Cores in CFL (Consumer Electronics) Application</p>
				<p>Toroidal Core and EE Cores in CFL (Consumer Electronics) Application</p>
				<p>EFD Cores in LED Lighting Application</p>
				<p>ER & ETD Cores in Power Conversion Application</p>

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Ferrite Core	Component Assembly	PCB Assembly	Final Product	Application Remarks
				<p>RM Cores for Medium Power Conversion in Communications Application</p>
				<p>PQ Cores for Medium Power Conversion in Communications Application</p>
		<p style="text-align: center;"><i>Not Applicable</i></p>		<p>Toroidal Iron Powder Cores for Industrial Electronics Application</p>