Comparison of Inductor Core Materials

	Iron Powder	Hi-Flux	SUPER-MSS	Molybdenum Permalloy	Ferrite
Magnetic Material	Iron Particles	50% Nickel, 50% Iron Alloy Particles	85% Iron, 9% Silicon, 6% Aluminum Alloy Particles	81% Nickel, 17% Iron, 2% Molybdenum Alloy Particles	Ceramic, Manganese-Zinc Oxides Joined with Iron Oxides
Type of Gap	Distributed	Distributed	Distributed	Distributed	Discrete
Gap Insulation	Organic and Inorganic	Inorganic	Inorganic	Inorganic	Air
DC Bias H Field for 50% μ — A/m	5600	9500	7200	8000	5600
DC Bias H Field for 50% μ — Oe	70	120	90	100	70
Typical loss at 100 kHz, 0.05 T (500 G), mW/cm³	800	260	200	120	230
Typical Max. Change in AC μ 0 to 0.4 T (0 to 4000 G)	+260%	+7%	-20%	-6%	—
Permeability Range	3 to 100	14 to 160	26 to 125	14 to 350	Determined by Gap
Curie Temp., °C	750	500	600	400	200
Max. Temp., °C	75 to130	130 to 200	130 to 200	130 to 200	130 to 200
Core Shapes	Various	Rings (Toroidal) Only	Rings (Toroidal) Only	Rings (Toroidal) Only	Various
Relative Price	Low	High	Medium	High	Medium

1. Effective Permeability for 50% μ with DC Bias, loss and AC μ comparisons is 60.
2. Ferrite permeability has a much steeper "roll-off" with current compared to the powder-type cores.
3. Loss shown for ferrite is without Litz wire and predominantly air-gap related.

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