POWDER CORES

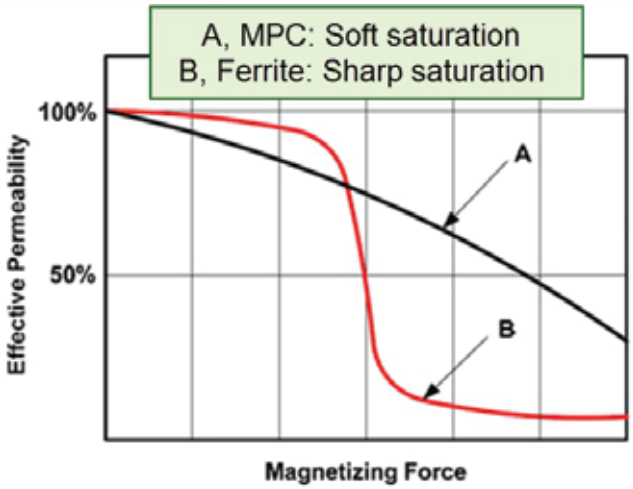
In view of the numerous advantages powder cores are widely used in industry for inductors production.

Air gaps inside the core causes the current value flowing through the coil can be much higher than in the case of the ferrite cores and doesn't cause a rapid saturation magnetics.

Powder cores are characterized by an exceptionally ability to store energy. Furthermore, they don't emit sound and acoustic disturbances which may occur in the components where the gapped ferrite cores applied.

Basically, powder cores can be devided into two groups:

- iron powder cores;
- alloy powder cores.



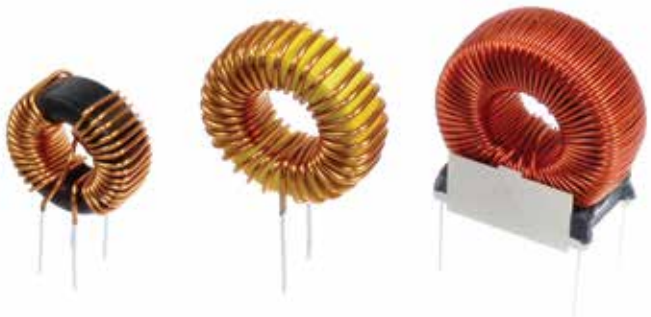
IRON POWDER CORES

The cores are made of a number iron powder materials. Each material has an individual and unique code with different coating colors, which identifies easily magnetics.

The various materials differ in permeability, frequency range, the magnetization curve, power loss, etc.

Due to its properties, iron powder cores are relatively inexpensive magnetic materials for the production of various chokes in power systems and EMI.

Typical components manufactured on the basis of iron powder cores are use in DC output chokes, PFC chokes and coils to eliminate interference differential method.



The disadvantage are large power loss generated in the iron cores therefore they are not so commonly used in the pulse transformers. Iron powder cores are produced mainly as a toroidal cores, but there are also available in E, U shape and cylindrical cores.

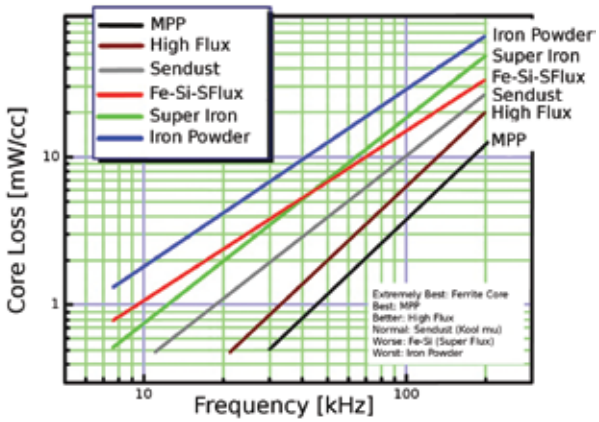
ALLOY POWDER CORES

In contrast to the cores made of iron powder, alloy powder cores are characterized by a high stability of inductance in a wide temperature range and low power loss. Due to the composition and content of metals there are several groups of alloy materials.

MPP is a magnetic material made of Fe-Ni-Mo alloy, which at a maximum high Q value generates low power losses. Inductance of MPP inductive components is very stable even at high current flowing through winding. It is particularly recommended for filtering circuits with small power losses.

Undoubtedly, the biggest advantage of the High Flux material is a high magnetic flux density and the high value of the saturation Bs. Due to its characteristics High Flux has an excellent ability to store energy. The use of the material produced from the Fe-Ni alloy is recommended for chokes, where the value of the current flowing through the windings is relatively high. This allows the use of smaller size of the core and in consequence reduce production costs.

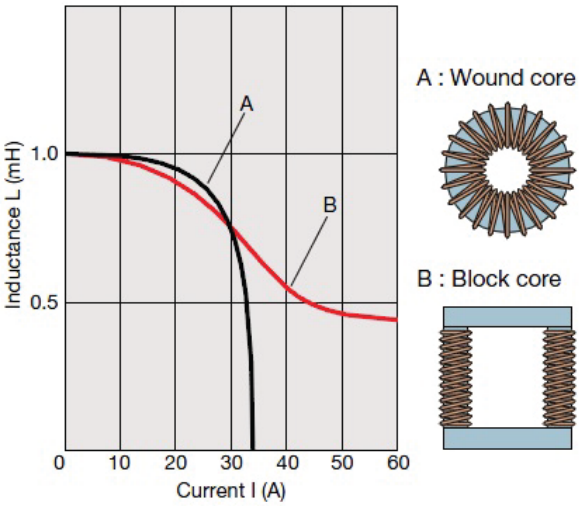
Sendust powder cores Fe-Si-Al generate slightly higher power loss than the MPP and High Flux, but much lower than iron powder cores.



Probably the fact that they belong to a group cheapest magnetic materials (produced from alloys of iron) has a significant impact on the extensive use of Sendust core in production output chokes, PFC chokes and pulse transformers.

Mostly alloy powder cores are produced as toroidal cores.

But it should be noted that the alloy powder cores are also available in the form of large block shapes and which can be freely configured and build high-power inductive components.



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