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FERROXCUBE
A YAGEO COMPANY

FIND THE BALANCE WITH

FERROXCUBE 3P1

A new generation material for the future´s energy solutions

High saturation
Reduced losses
No thermal-aging
At a cost effective price

FERROXCUBE
A YAGEO COMPANY

3P1

A new generation material for the future´s energy solutions

FERROXCUBE offers a new generation of iron powder cores, a true alternative to laminated steel and metal alloys. Cores manufactured with 3P1 iron powder will offer the market´s best cost - Tesla ratio for use in low and medium frequency chokes and inductors.

The 1.45 Tesla saturation level make 3P1 ideal as high energy choke, perfectly suited for renewable energy industry.

The greatest part of the total electricity demand in the world is nowadays met by nuclear and fossil power plants while only a small part is provided by the so-called renewable energies. Among these green energy sources, solar and wind are the ones that are experiencing the biggest develop and acceptance. Their main advantages over traditional energy sources are world famous; these are endless non-contaminant energy power sources that can generate the electricity next to the cities where it is consumed.

The next goal for governments and companies is the achievement of a green energy generation cost highly competitive with the one achieved nowadays by nuclear and fossil power plants. With regard to this, semiconductors manufacturers and now also FERROXCUBE with its 3P1 contribute with power engineering in the development of more efficient as well as cost-concerned photovoltaic and wind power systems.

With their great inductance under load behavior, power inductors based on 3P1 cores will be the perfect solution as input and output chokes not only in solar and wind inverters but also for Uninterruptible Power Supplies (UPS) and systems based on Fuel cells.

FERROXCUBE 3P1 keeps all key features of conventional powdered iron over laminated steel and other metal alloys:

- High energy storage at low volume.
- Moderate-cost tooling.
- Inexpensive raw material (iron powder).
- Ferroxcube´s pressing capabilities make a wide range of sizes and shapes possible.

And exceeds in these characteristics:

- Increased effective permeability (μe=110).
- Lower losses than traditional iron powder cores (50% less typically) with optimal performance achieved at 10KHz although higher frequencies are also possible.
- 3P1 cores are completely free of organic binder after the annealing process. Therefore, inductors based on 3P1 will not suffer any of the thermal aging consequences associated with traditional iron powder cores.

With FERROXCUBE 3P1 power inductor manufacturers will be able to produce low loss, compact, and light chokes at more competitive prices making at the same time the inverters where they are used highly efficient.

	3P1	Ferrite	Conventional Iron Powder	Sendust	Laminated steel
Permeability	Average	High	Lowest	Low	High
Losses	Average	Lowest	High	Low	Highest
Saturation	High	Lowest	Average	Average	Highest
Cost	Low	High	Lowest	Average	Average

Table 1. Main features for various magnetic core materials.

	Value
Density:	7.3 g/cc
Resistivity:	8000 μOhm x m
Permeability:	110
Bsat (10000 A/m):	1.45 T

Table 2. 3P1 characteristics

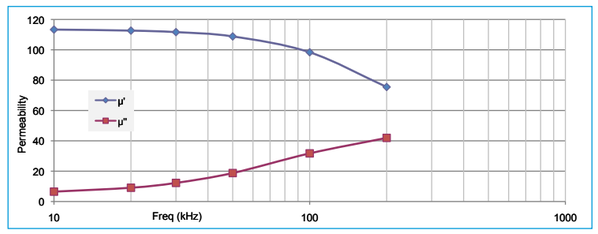

Figure1. Complex permeability as a function of frecuency

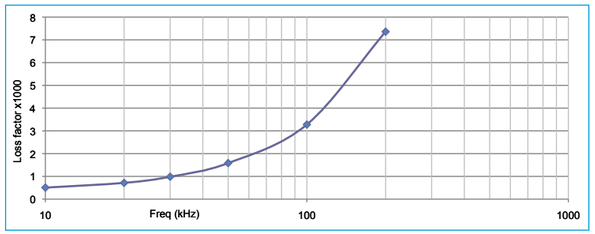

Figure 2. Loss factor as a function of frequency

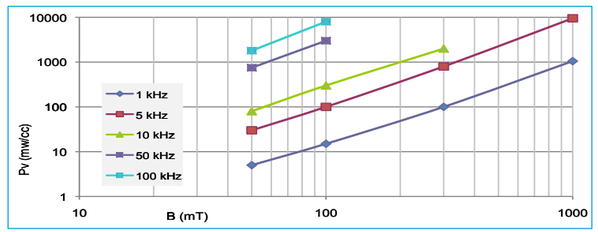

Figure 3. Specific power loss as a function of peak flux density with frequency as a parameter

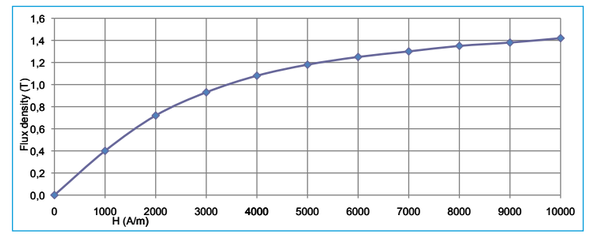

Figure 4. Flux density as a function of magnetic field strength

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