

MATERIAL INFORMATION

NANOCRYSTALLINE CUT CORES

MADE OF VITROPERM® 500 FOR TRANSFORMERS

Applications:

- High frequency, high power transformers for converters in drives, traction, power supplies, welding, induction heating

Key Properties:

- Lower losses than other materials, due to nanocrystalline rapid solidified alloy with thickness of approx. 18 µm
- Low audible noise due to lower magnetostriction compared to other materials
- High flux density material (1.2 Tesla)



VITROPERM – typical data

Saturation flux density	$B_s = 1.2 \text{ T}$
Coercivity (static)	$H_c < 3 \text{ A/m}$
Saturation magnetostriction	$\lambda_s = 10^{-8} \dots 10^{-6}$
Electrical resistivity	$\rho \sim 115 \mu\Omega\text{cm}$
Curie temperature	$T_c > 580 \text{ }^\circ\text{C}$
Material permeability	$\mu_i = 20000 \dots 50000^*$
Core losses (2500Hz, 0.5 T)	$P_{Fe} \leq 1 \text{ W/kg}^*$
Tape thickness:	approx. 18 µm
Material Composition:	$(\text{FeSi})_{89}(\text{BNbCu})_{11} \text{ At.-%}$

* Toroidal core without air gap

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ADVANCED MATERIALS – THE KEY TO PROGRESS

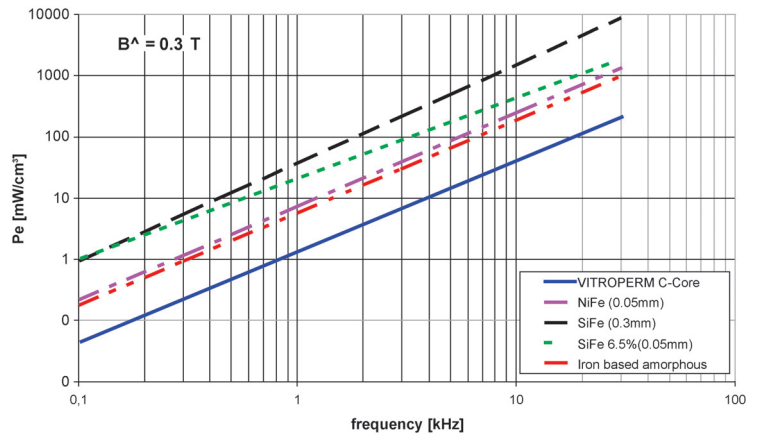
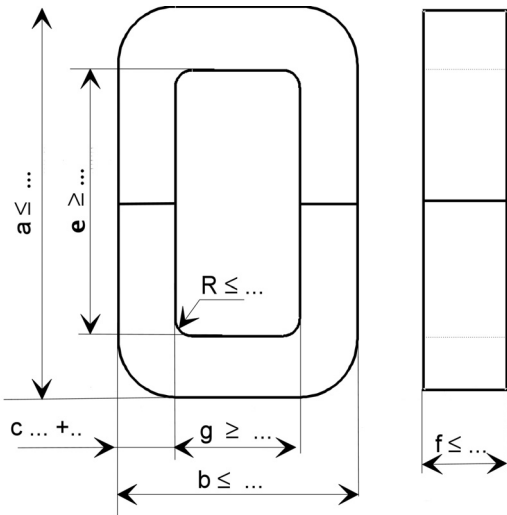


Fig. 1: Losses vs. frequency of cut cores (airgap closed) made of different materials.

Part number	Weight	Iron cross section A_{Fe}	Mean iron path length l_{Fe}	Limiting dimensions (for 2 U-shaped halves)					
				Length a / mm	Width b / mm	Window length e / mm	Window width g / mm	Leg width c / mm	Height f / mm
T60102-L2...	g	cm ²	cm						
...083-W156	378	2.8	18.2	83.7	48.4	50.5	16	15.8	26.6
...130-W157	941	4.5	28.4	130.0	76.0	78.0	25.0	24.7	26.6
...198-W171	1,680	5.3	43.2	198.0	115.0	118.0	38.0	37.6	21.6
...157-W159	1,360	5.4	34.2	157.5	90.0	95.0	30.0	29.6	26.6
...157-W158	1,570	6.2	34.2	157.5	90.0	95.0	30.0	29.6	31.6
...198-W160	2,520	7.95	43.2	198.0	115.0	118.0	38.0	37.6	31.6

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