NANOCRYSTALLINE CUT CORES MADE OF VITROPERM® 500 FOR TRANSFORMERS

MATERIAL INFORMATION

APPLICATIONS

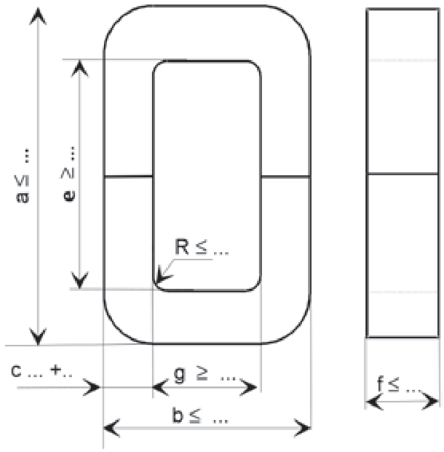
- High frequency, high power transformers for converters in drives, traction, power supplies, welding, induction heating

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	$B_S = 1.2$ T
Coercivity (static)	$H_C < 3$ A/m
Saturation magnetostriction	$\lambda_S = 10^{-8} \ldots 10^{-6}$
Electrical resistivity	$\rho \sim 115$ µΩcm
Curie temperature	$T_C > 580$ °C
Material permeability	$\mu_i = 20{,}000 \ldots 50{,}000$*
Core losses (2,500 Hz, 0.5 T)	$P_{Fe} \leq 1$ W/kg*
Tape thickness	approx. 18 µm
Material composition	$(FeSi)_{89}(BNbCu)_{11\ At.-\%}$

* Toroidal core without air gap



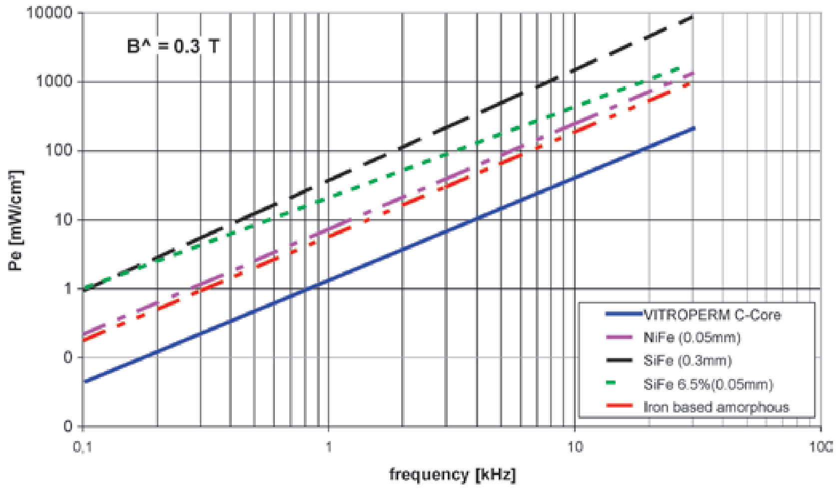


Fig. 1: Losses vs. frequency of cut cores (airgap closed) made of different materials.

Part number	**Weight**	**Iron cross section**	**Mean iron path length**	**Limiting dimensions (for 2 U-shaped halves)**					
		A_{Fe}	l_{Fe}	**Length**	**Width**	**Window length**	**Window width**	**Leg width**	**Height**
T60102-L2…	**g**	**cm²**	**cm**	**a/mm**	**b/mm**	**e/mm**	**g/mm**	**c/mm**	**f/mm**
083-W156	378	2.8	18.2	83.7	48.4	50.5	16.0	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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