Specification for Soft Magnetic Material

kOr 122

Nominal data

	Symbol	Unit		Conditions	
Chemical composition		at%	$(Fe,Co,Ni)_{100-a-b-4}Cu_1Nb_3Si_aB_b$		
Saturation flux density (saturation induction)	B_{sat}	mT	1220	H > 100 A/m	25°C
			1120	H > 100 A/m	100°C
Curie temperature	T_c	°C	600		
Resistance	ρ	µΩm	1,15		
Density	d	g / cm³	7,4	annealed	
Saturation magnetostriction	λ_S	ppm	2 - 4	annealed	
Tape thickness[2)]	d	µm	20		
Tape width	b	mm	3 - 50		
Filling factor (stacking factor)	FF	%	>80	b ≤ 25 mm	
			>76	b > 25 mm	
recommended max. storage and operational temperature		°C	150 - 200	depending on specification and operational conditions	

Nominal Permeability	µ'		4.000 - 18.000	adjustable[1)]
Remanence	B_r	mT	40	static
Power losses	P_{Fe}	W/kg	6	10 kHz / 0,6 T
			85	100 kHz / 0,3 T
				nominal µ ≥ 8000; without resonance or pressure effects

Remarks:

1) Permeability µ can be adjusted.

A_L-values are calculated according to $A_L = \mu_r \mu_0 \frac{A_{Fe}}{l_{Fe}}$

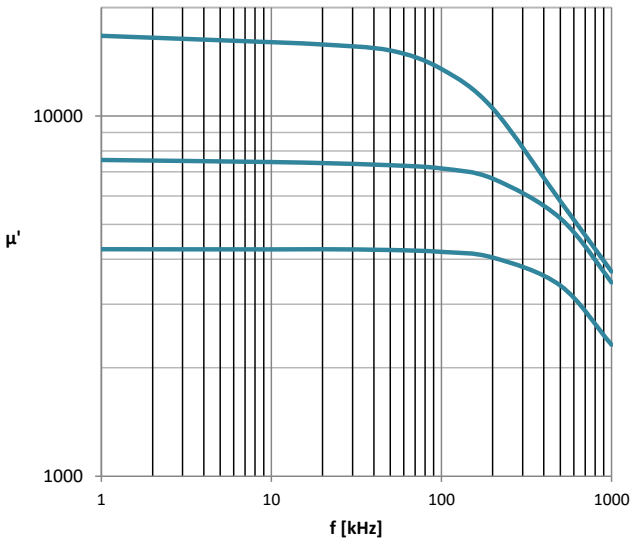
(A_L in mH, A_{Fe} in mm², l_{Fe} in mm, $\mu_0 = 4\pi \cdot 10^{-7}$ Vs/Am)
μ_r in this formula is identical with µ' in this document.
A_{Fe} and l_{Fe} depend on the core dimensions and are indicated in the core datasheets.

2) Effective tape thickness, calculated from length, width and density of a tape sample.
Geometrical tape thickness (measured with a tape stack using a gauge) is higher by 10% - 15% due to roughness.

Material data of specific product specifications may differ due to geometry and dimension.

Characteristic curves

Permeability vs. Frequency

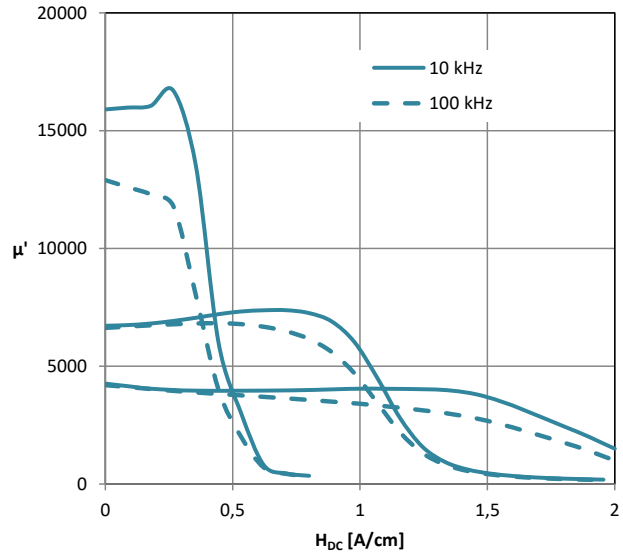


Notes:

N = 1, U_{eff} = 100 mV

Typical curves are given for toroidal cores
with nominal permeability (10 kHz)
of 16.000, 8000, and 4000.

Permeability vs. Bias Field



Notes:

N = 1, U_{eff} = 100 mV
$I_{DC} = H_{DC} \cdot l_{Fe}$

Typical curves are given for toroidal cores
with nominal permeability (10 kHz)
of 16.000, 8000, and 4000.

Power losses

Steinmetz-coefficients (nominal data):

$$P_{Fe} = k\, f^{a} \hat{B}^{b}$$

P_{Fe} in W/kg, f in kHz, B in T
Valid for B ≤ 0,6 T, f = 5 … 150 kHz; losses are higher for nominal B > 0,6 T
Valid for room temperature.

	Part Number	k	a	b
kOr 122 in protection case, nominal μ ≥ 8000	122-TB-____-≥06-y	0,3	1,77	2,07
kOr 122 in protection case, nominal μ < 8000	122-TB-____-<06-y	0,45	1,77	2,07

kOr 122 is magnetostrictive; cores may show mechanical resonances, and are affected by mechanical stress. Above formula gives power losses without resonance and pressure effects. Resonance effects on losses are observed for nominal flux density >0,1 T. In resonance, losses may increase by a factor of 3.
For calculation of resonance frequencies, ask Magnetic Products Technology Centre of Acal BFi.

Part number system

	material	-	shape	finish	-	size	-	permeab.	-version
example:	122	-	T	B	-	1027625	-	06	-1

material:	number denotes B_S in 10 mT
shape:	T = toroid, R = rectangular, O = oval
finish:	B = protection box (usually plastic case), E = Epoxy coating
size:	toroid: OD ID H; rectangular: standard number or B C H
permeability:	minimum permeability in 1000
version:	version number (e.g. different coatings). This is not the revision state!