Acal BFi kOr

Specification for Soft Magnetic Material

Material: **kOr 170**

Nominal data:

	Symbol	Unit		Conditions	
Chemical composition		at%	$Fe_{79-82}Cu_1P_{1-3}(Si,B)_{14-18}$		
Saturation flux density (saturation induction)	B_{sat}	mT	1700	H > 5000 A/m	25°C
			1500	H = 500 A/m	25°C
			1400	H = 500 A/m	100°C
Curie temperature	T_c	°C			
Resistance	ρ	µΩm			
Density	d	g/cm³	7,5	annealed	
Saturation magnetostriction	λ_S	ppm	~15	annealed	
Initial permeability[1] (uncoated)	μ_i		10000		25°C
Remanence	B_r	mT	<500	50 Hz	
Power losses (uncoated)	P_{Fe}	W/kg	3	1 kHz / 1,0 T	
			20	10 kHz / 0,6 T	
			0,5	16 kHz / 0,037 T	
Tape thickness[2]	d	µm	20		
Tape width	b	mm	5 - 65		
Filling factor (stacking factor)	FF	%	>80	b ≤ 25 mm	
			>76	b > 25 mm	

Remarks:

1) Permeability is the material parameter

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)

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 characteristics (page 2) are measured with an annealed toroid core without gaps or cuts.
For impregnated rectangular cores, see page 3.
Material data of specific product specifications may differ due to geometry and dimension.

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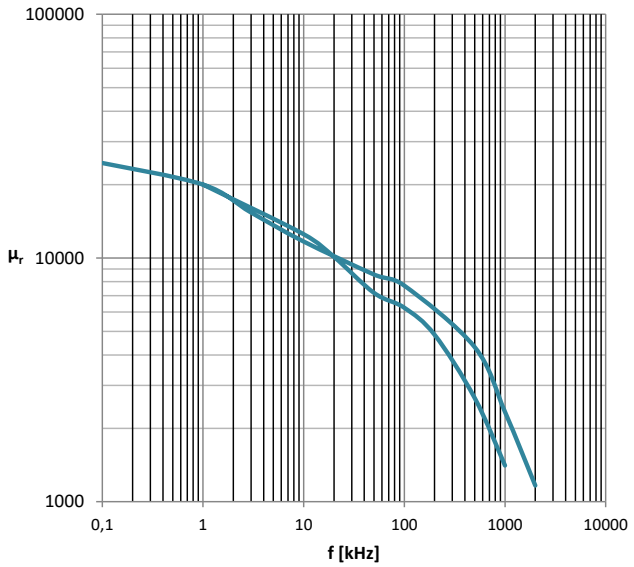
Complex Permeability vs. Frequency



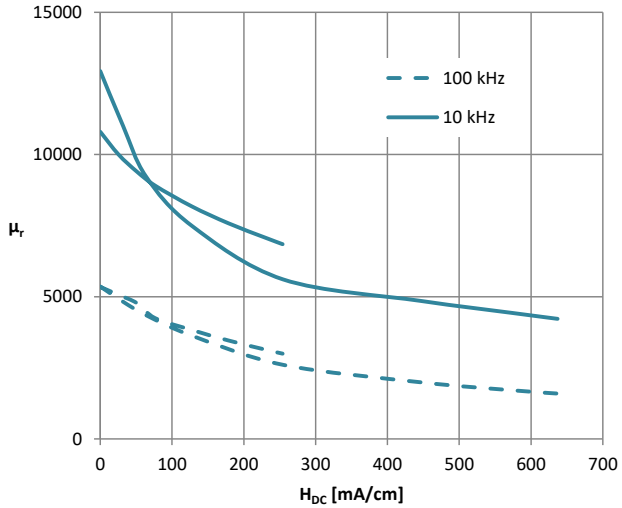
Notes:

N = 1, U_{eff} = 100 mV

Typical curves

Due to magnetostriction, resonance effects may be visible in μ(f) curves.

Relative Permeability vs. Bias Field



Notes:

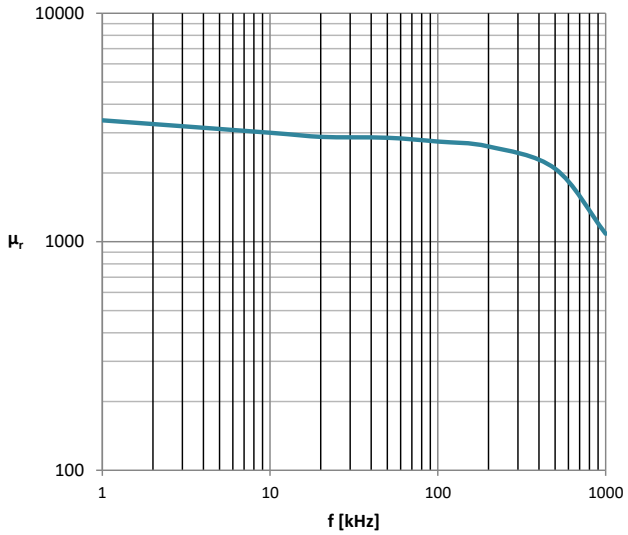
N = 1, U_{eff} = 100 mV

$I_{DC} = H_{DC} \cdot I_{Fe}$

Typical curves are given for cores with nominal permeability (10 kHz) of 10.000.

Curves for Epoxy impregnated rectangular cores

Effective Permeability vs. Frequency



Notes:

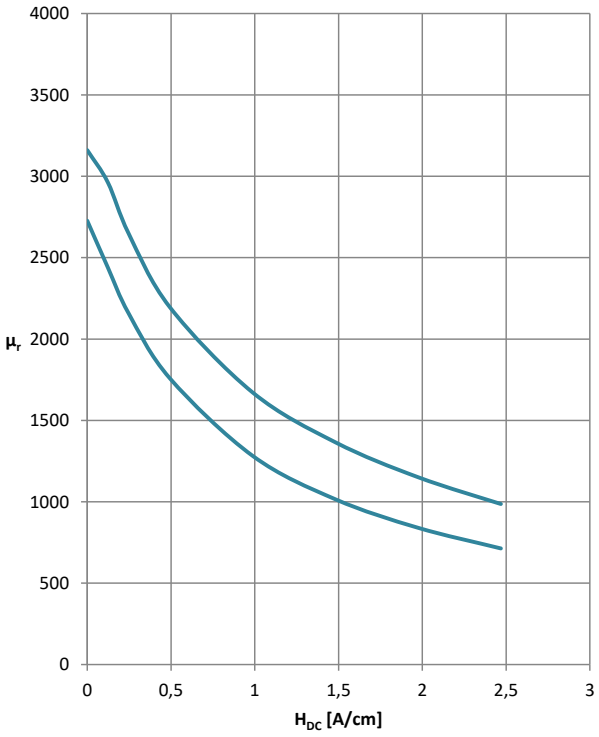
Typical curves are shown.

Cores are impregnated with Epoxy

N = 1, U_{eff} = 100 mV

Influence of gap depends on the ratio of magnetic path length and gap width. Displayed example refers to magnetic path length of 280 mm.

Effective Permeability vs. Bias Field



Notes:

Cores are impregnated with Epoxy

N = 1, U_{eff} = 100 mV
$I_{DC} = H_{DC} \cdot l_{Fe}$
upper curve: 10 kHz; lower curve: 100 kHz

Influence of gap depends on the ratio of magnetic path length and gap width. Displayed example refers to magnetic path length of 320 mm.