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Custom Services for Magnetic Components

Acal BFi kOr

Specification for Soft Magnetic Material

Material: **kOr 156** rev. 2

Nominal data:

	Symbol	Unit		Conditions	
Chemical composition		at%	~$Fe_{80}Si_7B_{13}$		
Saturation flux density (saturation induction)	B_{sat}	mT	1560 1470	H > 300 A/m H > 300 A/m	25°C 100°C
Curie temperature	T_c	°C	400		
Resistance	ρ	µΩm	1,3		
Density	d	g / cm^3	7,18		
Saturation magnetostriction	λ_S	ppm	27	annealed	
Initial permeability[1)]	μ_i		3000 - 15 000 1500 - 5000	in protection case impregnated	25°C 25°C
Power losses (uncoated, uncut)	P_{Fe}	W/kg	10 80 1,2	1 kHz / 1,0 T 10 kHz / 0,6 T 16 kHz / 0,037 T	
Tape thickness[2)]	d	µm	25		
Tape width	b	mm	5 - 130		
Filling factor (stacking factor)	FF	%	>85 >80	b ≤ 25 mm b > 50 mm	
recommended max. storage and operational temperature		°C	150		

Remarks:

1) Initial Permeability depends on annealing and finishing. Given values refer to toroidal cores without gaps or cuts annealed in transverse field.

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 mm^2, 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.

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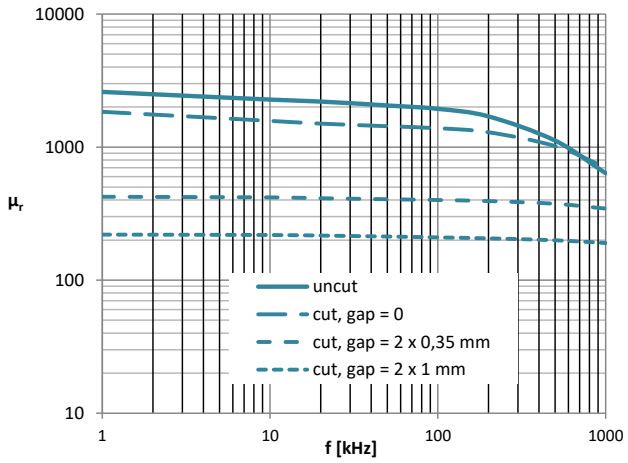
Effective Permeability vs. Frequency

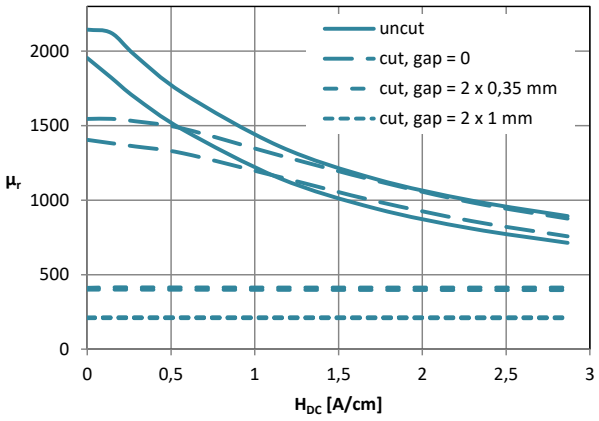


Notes:

Typical curves are shown.
N = 1, U_{eff} = 100 mV
Cores are impregnated with Epoxy

Nominal / minimum permeability for
single cut cores without additional gap:
10 kHz:
100 kHz:
1500 / 900
Influence of g 1100 / 700
magnetic path length and gap width.
Displayed example refers to magnetic path length of 280 mm.

Effective Permeability vs. Bias Field



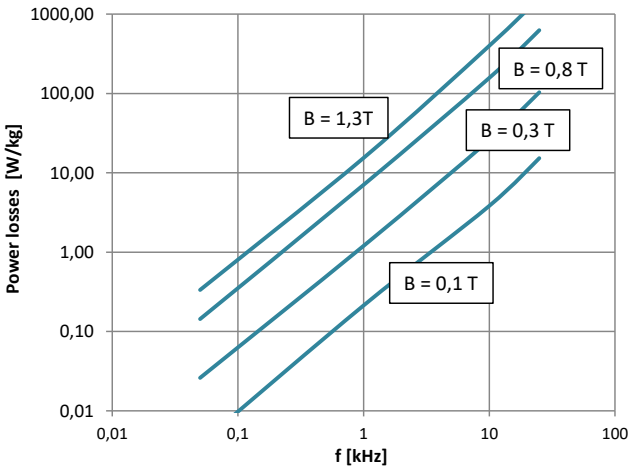
Notes:

Cores are impregnated with Epoxy

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

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

Power Losses vs. Frequency and Induction Amplitude



Notes:

Typical losses are given for uncut cores without impregnation or coating,
excited with sinusoidal voltage of an amplitude corresponding to the indicated peak induction.

Losses increase under mechanical stress, e.g. coating, impregnation, and wire winding without sufficient protection.

Additional losses occur
when cutting and introducing gaps.