acal bfi — European leader in advanced technology solutions

Custom Services for Magnetic Components

Acal BFi kOr

Specification for Soft Magnetic Material

Material: **kOr 140 / kOr 140HF** rev. 1

Nominal data:

	Symbol	Unit		Conditions
Chemical composition		at%	$Fe_{75}Cu_1(SiBNbMo)_{24}$	
Saturation flux density	B_{sat}	mT	1400	H > 5000 A/m 25°C
(saturation induction)			1300	H = 200 A/m 25°C
			1220	H = 200 A/m 100°C
Curie Temperature	T_c	°C	600	
Resistance	ρ	µΩm	1,15	
Density	d	g / cm^3	7,4	annealed
Saturation magnetostriction	λ_S	ppm	~3	annealed

Initial Permeability (uncoated)	μ_i		30.000 - 70.000	adjustable[1)] 25°C
Remanence	B_r	mT	<200	µ = 30.000, 50 Hz
Power losses (uncoated)	P_{Fe}	W/kg	4	10 kHz / 0,6 T
			65	100 kHz / 0,3 T (kOr 140)
			55	100 kHz / 0,3 T (kOr 140HF)
Tape thickness[2)]	d	µm	20	kOr 140
			16	kOr 140HF
Tape width	b	mm	2 - 65	
Filling factor (stacking factor)	FF	%	>80	kOr 140: b≤25 mm
			>76	kOr 140: b>25 mm; all kOr 140HF

Remarks:

1) Permeability μ_i can be adjusted in the range of about 30.000 - 70.000, corresponding to nominal values of 30.000 - 70.000 at 10 kHz.

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.

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

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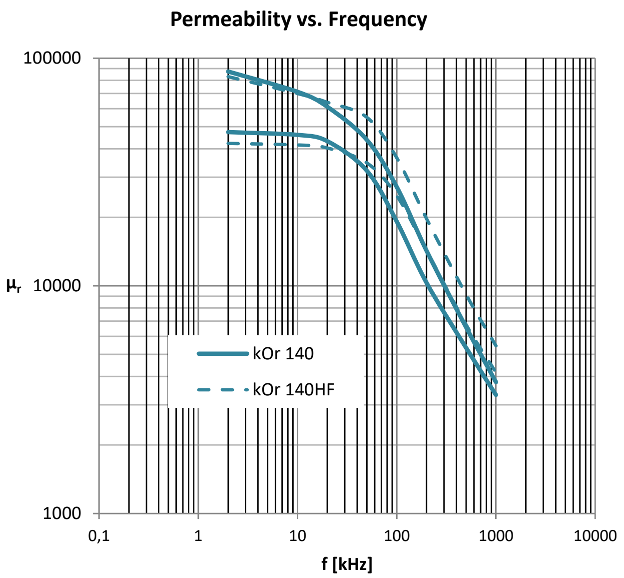
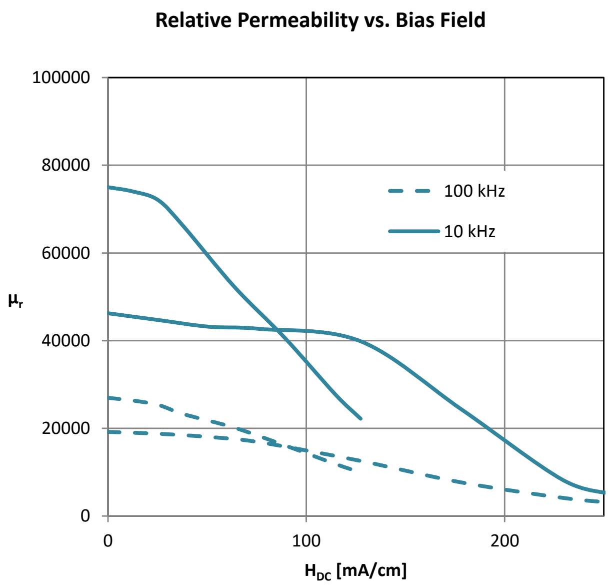


Notes:

N = 1, U_{eff} = 100 mV

Typical curves are given for cores with nominal permeability (10 kHz) of 40.000 and 70.000. Data for other premeabilities may be approximated using these data.



Notes:

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

Typical curves are given for cores with nominal permeability (10 kHz) of 40.000 and 70.000. Data for other premeabilities may be approximated using these data.

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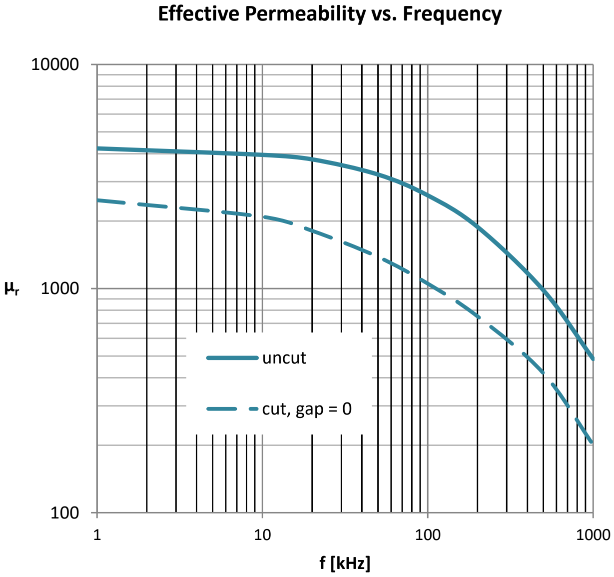
Curves for Cut Cores (Single cut)

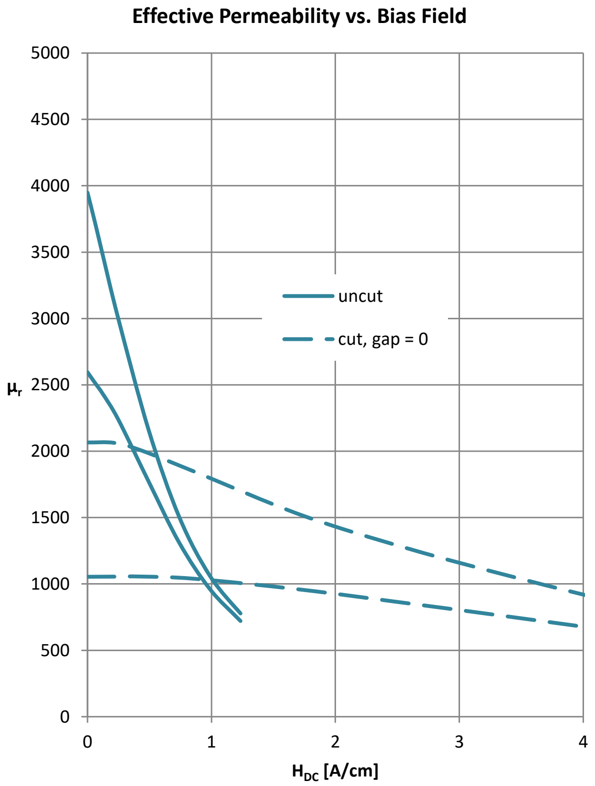


Notes:

Typical curves are shown.
N = 1, U_{eff} = 100 mV

Cores are impregnated with Epoxy

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



Notes:

Cores are impregnated with Epoxy

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