

Specification for Soft Magnetic Material

Material: **kOr 156**

rev. 1

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Nominal data:

	Symbol	Unit		Conditions
Initial Permeability ¹⁾	μ_i		3000 - 15 000	in protection case 25°C
			1500 - 5000	impregnated 25°C
Saturation Flux Density	B_{sat}	mT	1560	H > 3000 mA/cm 25°C
			1470	H > 3000 mA/cm 100°C
Curie Temperature	T_c	°C	400	
Resistance	ρ	$\mu\Omega m$	1,3	
Density	d	g / cm^3	7,18	
Saturation magnetostriction	λ_s	ppm	27	

Chemical composition		at%	~Fe ₈₀ Si ₇ B ₁₃	
Tape thickness ²⁾	d	μm	25	
Tape width	b	mm	5 - 130	
Filling factor (stacking factor)	FF	%	>85	b ≤ 25 mm
			>80	b > 25 mm

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 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.

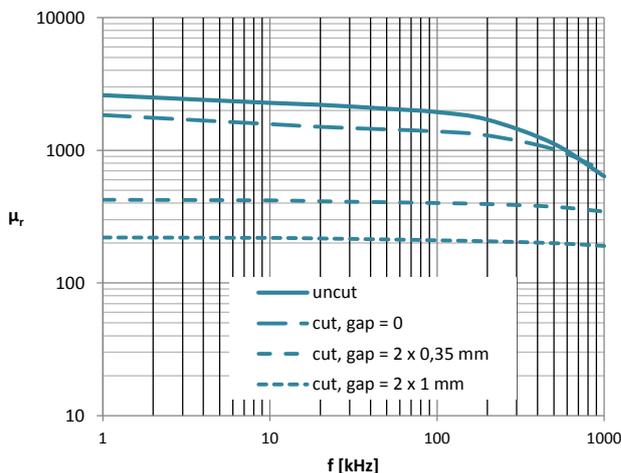
Geometrical tape thickness (measured with a tape stack using a gauge) is higher by 10% - 15% due to roughness.

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Effective Permeability vs. Frequency



Notes:

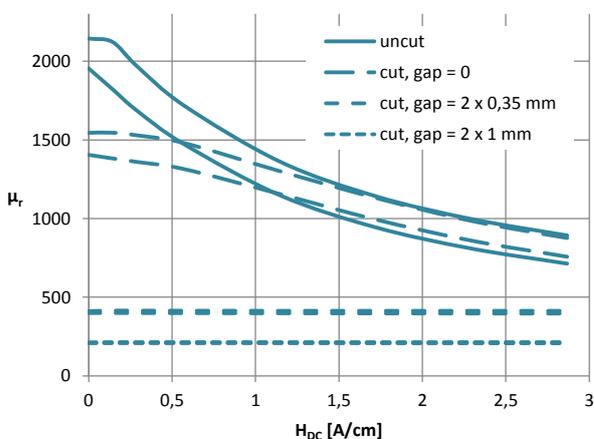
Typical curves are shown.

Cores are impregnated with Epoxy

$N = 1, U_{\text{eff}} = 100 \text{ mV}$

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

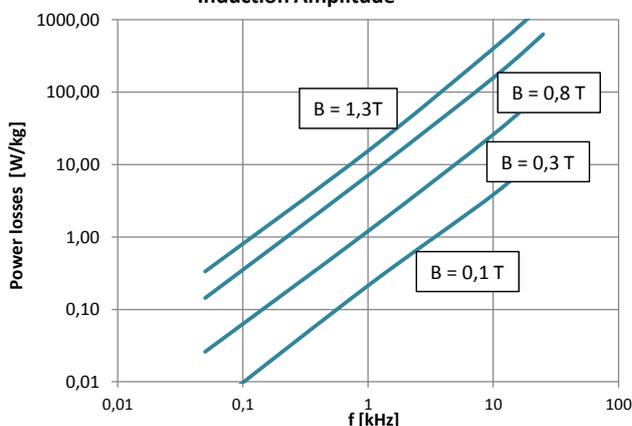
$N = 1, U_{\text{eff}} = 100 \text{ mV}$

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

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 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.