Specification for Soft Magnetic Material

Material: **kOr 120 / kOr 120HF**

Nominal data:

	Symbol	Unit		Conditions	
Chemical composition		at%	$Fe_{73,5}Cu_1Nb_3Si_{15,5}B_7$		
Saturation flux density	B_{sat}	mT	1200	H > 100 A/m	25°C
(saturation induction)			1120	H > 100 A/m	100°C
Curie temperature	T_c	°C	600		
Resistance	ρ	µΩm	1,15		
Density	d	g / cm^3	7,35	annealed	
Saturation magnetostriction	λ_S	ppm	<1	annealed	
Initial permeability (uncoated)	μ_i		20.000 - 200.000	adjustable[1)]	25°C
Nominal permeability	µ		30.000 - 120.000	adjustable[1)]	10 kHz
Remanence	B_r	mT	50	µ = 30.000, 50 Hz	
			150	µ = 100.000, 50 Hz	
Power losses (uncoated)	P_{Fe}	W/kg	5	10 kHz / 0,6 T	
			60	100 kHz / 0,3 T (kOr 120)	
			40	100 kHz / 0,3 T (kOr 120HF)	
Tape thickness[2)]	d	µm	20	kOr 120	
			16	kOr 120HF	
Tape width	b	mm	3 - 50		
Filling factor (stacking factor)	FF	%	>80	kOr 120: b≤25 mm	
			>76	kOr 120: b>25 mm; all kOr 120HF	
recommended max. storage and operational temperature		°C	120 - 200	depending on specification and operational conditions	

Remarks:

1) Permeability µ can be adjusted in the range of about 30.000 - 120.000 (nominal value 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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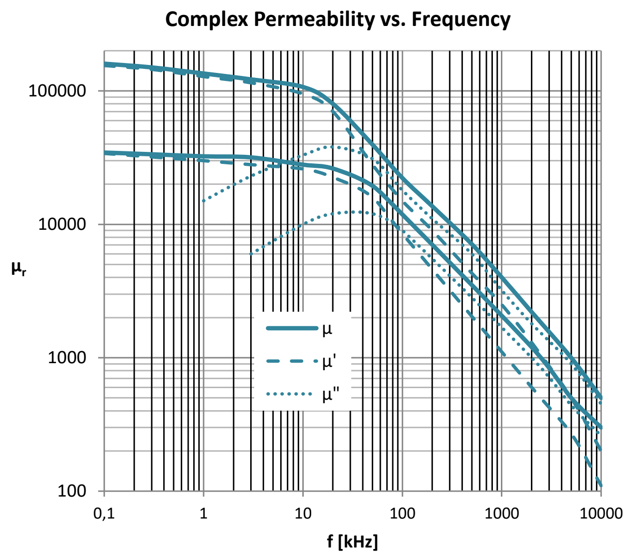
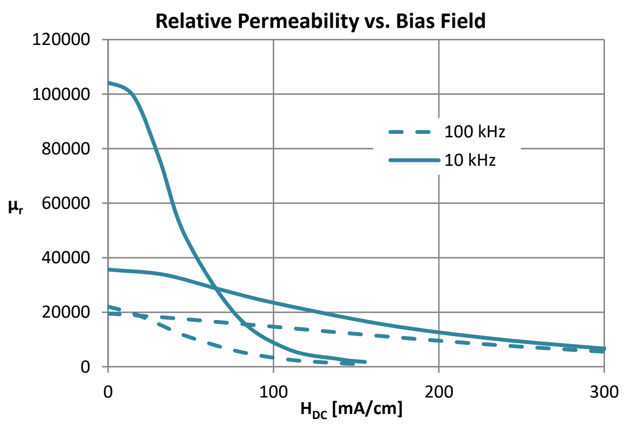


Notes:

N = 1, U_{eff} = 100 mV

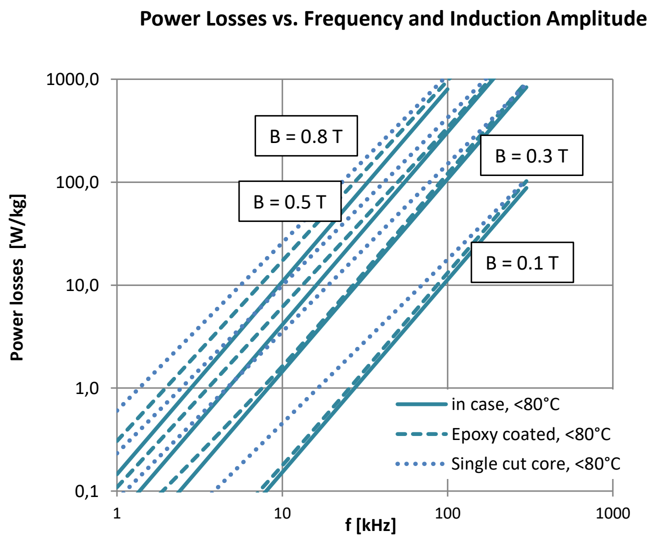
Typical curves are given for cores made of kOr 120 with nominal permeability (10 kHz) of 30.000 and 100.000. Data for other premeabilities may be approximated using these data.



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 30.000 and 100.000. Data for other permeabilities may be approximated using these data.



Notes:

Losses don't depend on permeability level.
Excitation with sinusoidal voltage of an amplitude corresponding to the indicated peak induction.

Losses of cores in plastic cases are nearly temperature independent, also at >80°C.
Losses of coated cores converge towards those of cores in cases between 80 and 130°C.

Power losses of impregnated cores might be higher than losses of coated cores, esp. <30 kHz.

Additional losses occur when cutting impregnated cores.

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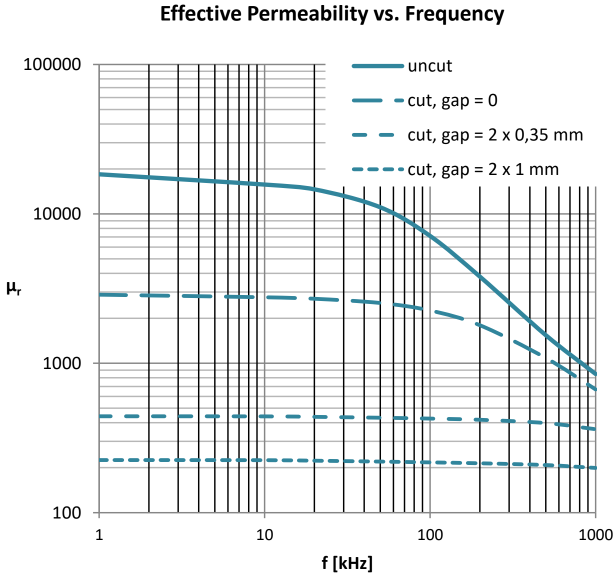
Data for Cut Cores (Single cut)



Notes:

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

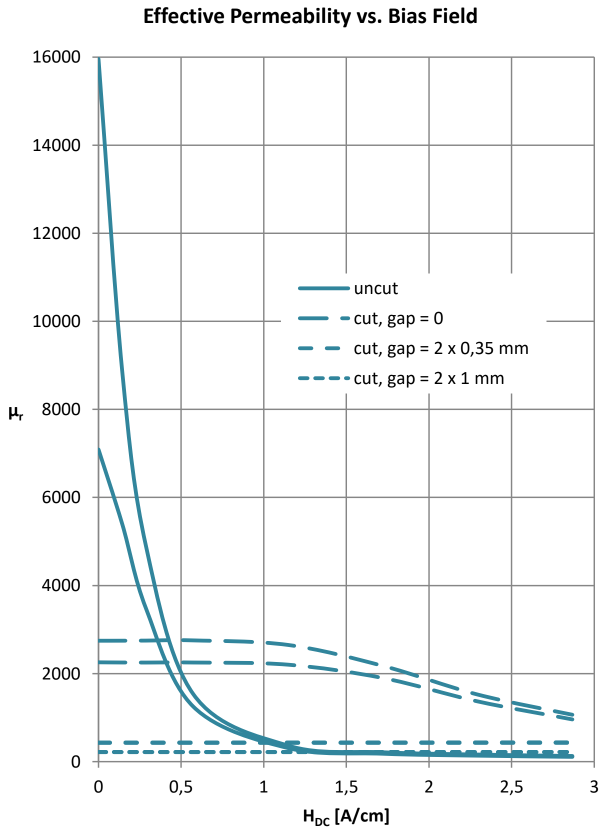
Cores are impregnated with Epoxy

Nominal / minimum permeability for single cut cores without additional gap:

10 kHz:	2500 / 1600
100 kHz:	1900 / 1200

Nominal permeability at 10 kHz up to 10.000 is possible with special cut quality on request.

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 280 mm.