Magnetic Properties of Ferrite Materials

Property	Unit	Symbol	68	67	61	51*	44
Initial Permeability @ B <10 gauss		μ_i	20	40	125	350	500
Flux Density @ Field Strength	gauss mT oersted A/m	B H	2700 270 40 3200	2300 230 20 1600	2350 235 15 1200	3200 320 10 800	3000 300 10 800
Residual Flux Density	gauss mT	B_r	1000 100	800 80	1200 120	1200 120	1100 110
Coercive Force	oersted A/m	H_c	7.0 560	3.5 280	1.8 144	0.60 48	0.45 36
Loss Factor @ Frequency	10^{-6} MHz	$\tan \delta/\mu_i$	500 100	150 50	30 1.0	40 1.0	125 1.0
Temperature Coefficient of Initial Permeability (20-70 ºC)	%/ºC		0.10	0.05	0.10	0.8	0.75
Curie Temperature	ºC	T_c	>500	>475	>350	>170	>160
Resistivity	Ω cm	ρ	$1\text{x}10^7$	$1\text{x}10^7$	$1\text{x}10^8$	$1\text{x}10^9$	$1\text{x}10^9$
Power Loss Density 25kHz - 2000 G - 100ºC 100kHz - 1000 G - 100ºC	mW/cm³	P	– –	– –	– –	– –	– –
Recommended Frequency Range	MHz						
Application Areas: Low flux density devices.			<400	<300	<100	–	–
Application Areas: EMI suppression.			–	–	>200	<1000	20-250
Application Areas: Power magnetics.			–	–	–	–	–
Application Areas: Special square loop ferrite.			–	–	–	–	–
See this page for additional material data			6	7	8	9	10

42 Material, specifically developed for absorber applications in anechoic chambers, is listed on page 126.

** New Fair-Rite material, added in this edition of the catalog.*

Additional ferrite mechanical and thermal characteristics are tabulated on page 159.

61 Material

A high frequency NiZn ferrite developed for a range of inductive applications up to 25 MHz. This material is also used in EMI applications for suppression of noise frequencies above 200 MHz.

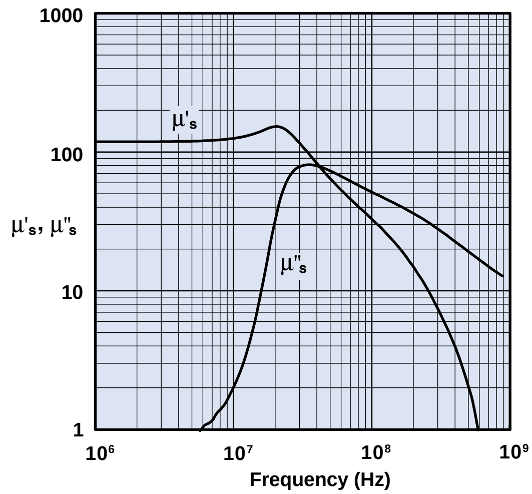
EMI suppression beads, beads on leads, SM beads, wound beads, multi-aperture cores, round cable EMI suppression cores, rods, RFID rods, and toroids are all available in 61 material.

Strong magnetic fields or excessive mechanical stresses may result in irreversible changes in permeability and losses.

61 Material Specifications:

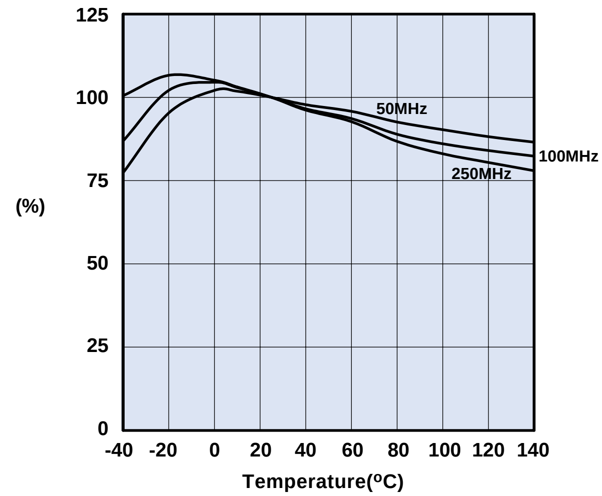
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	125
Flux Density	gauss	B	2350
@ Field Strength	oersted	H	15
Residual Flux Density	gauss	B_r	1200
Coercive Force	oersted	H_c	1.8
Loss Factor	10^{-6}	$\tan\delta/\mu_i$	30
@ Frequency	MHz		1.0
Temperature Coefficient of Initial Permeability (20 -70ºC)	%/ºC		0.10
Curie Temperature	ºC	T_c	>350
Resistivity	Ω cm	ρ	$1x10^8$

Complex Permeability vs. Frequency



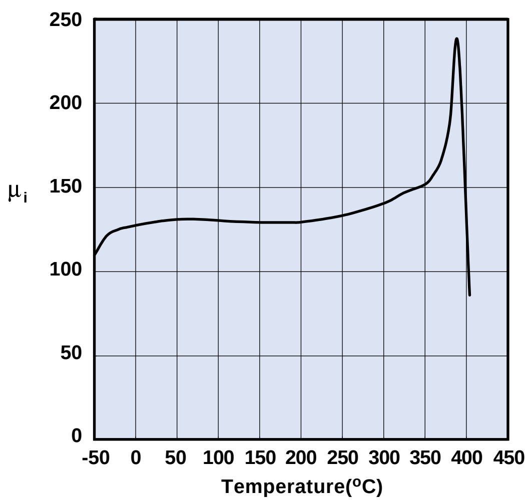
Measured on a 19/10/6mm toroid using the HP 4284A and the HP 4291A.

Percent of Original Impedance vs. Temperature



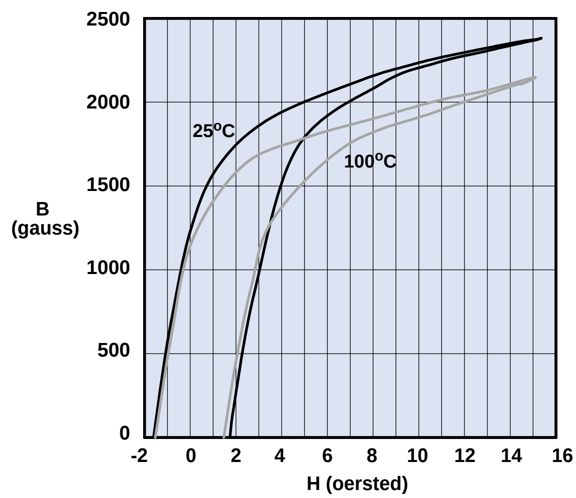
Measured on a 2661000301 using the HP4291A.

Initial Permeability vs. Temperature



Measured on a 19/10/6mm toroid at 100kHz.

Hysteresis Loop

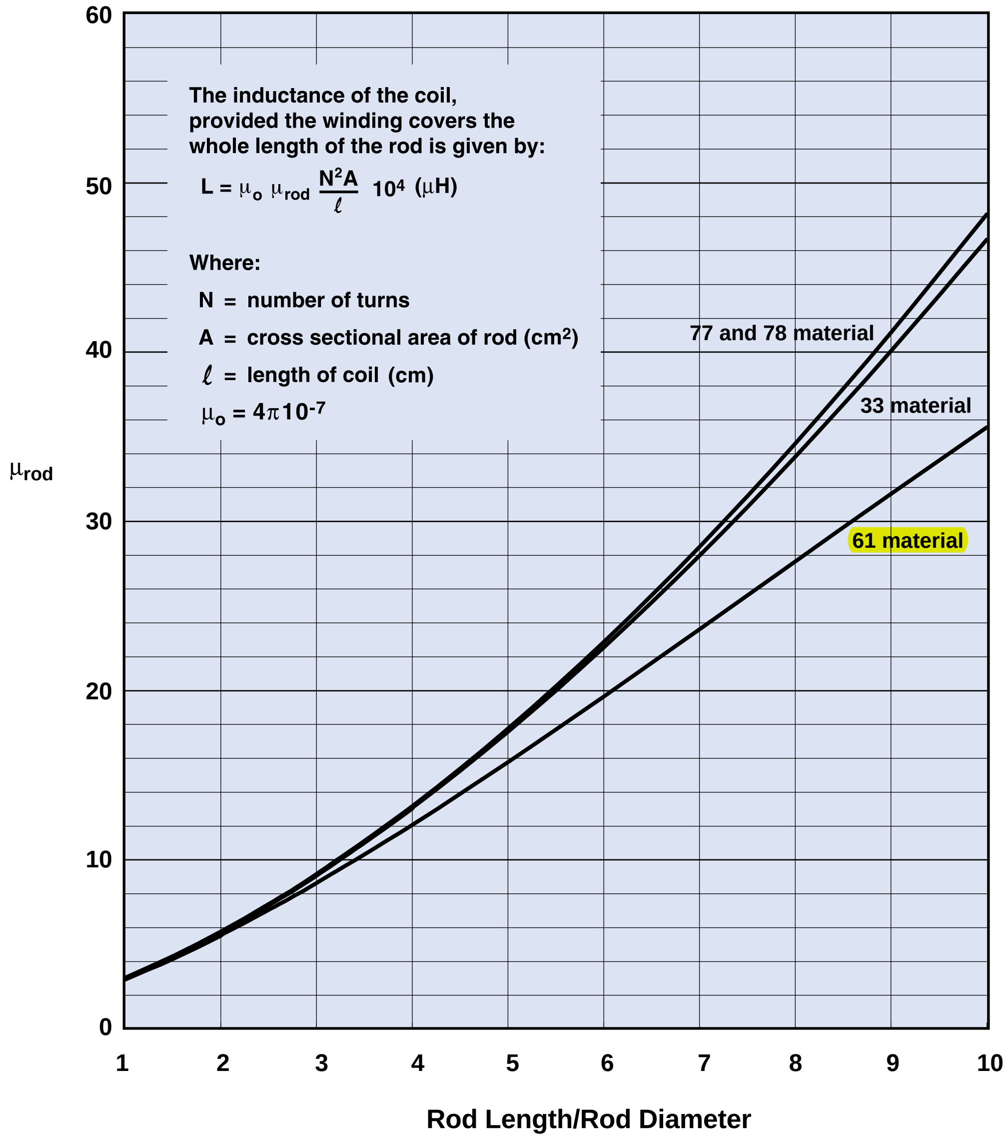


Measured on a 19/10/6mm toroid at 10kHz.

Rods

This family of curves shows the value of the effective permeability of a ferrite rod as a function of its length to diameter ratio, as well as a function of the material permeability of the rod. It illustrates that generally, a great difference exists between the material permeability and the effective permeability of a rod. It also illustrates how, in some instances, the effective permeability of a rod can be influenced by changing its mechanical dimensions more than by changing its material permeability, while in other cases, the reverse is true.

Rod Permeability vs. Rod Length divided by Rod Diameter



P.O. Box J,One Commercial Row, Wallkill, NY 12589-0288
Fair-Rite Products Corp.
Phone: (888) FAIR RITE / (845) 895-2055 (888) 324-7748 • FAX: (888) FERRITE / (845) 895-2629 (888) 337-7483 • www.fair-rite.com • E-Mail: ferrites@fair-rite.com
Note: (914) Area Code has changed to (845).