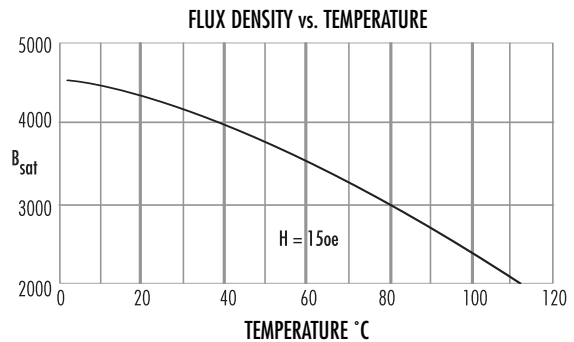
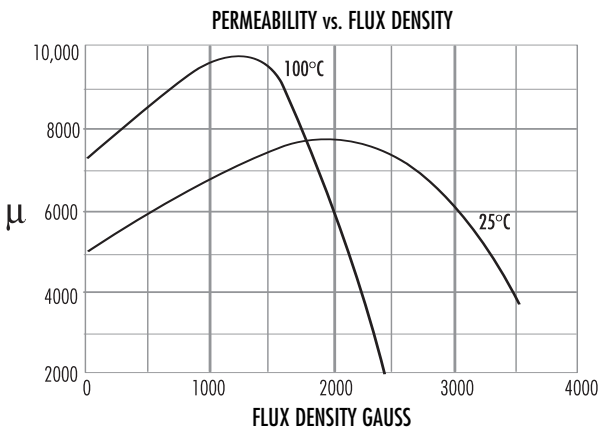
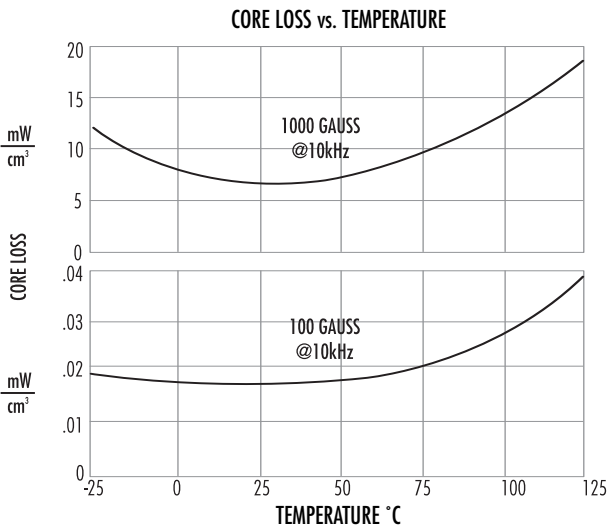
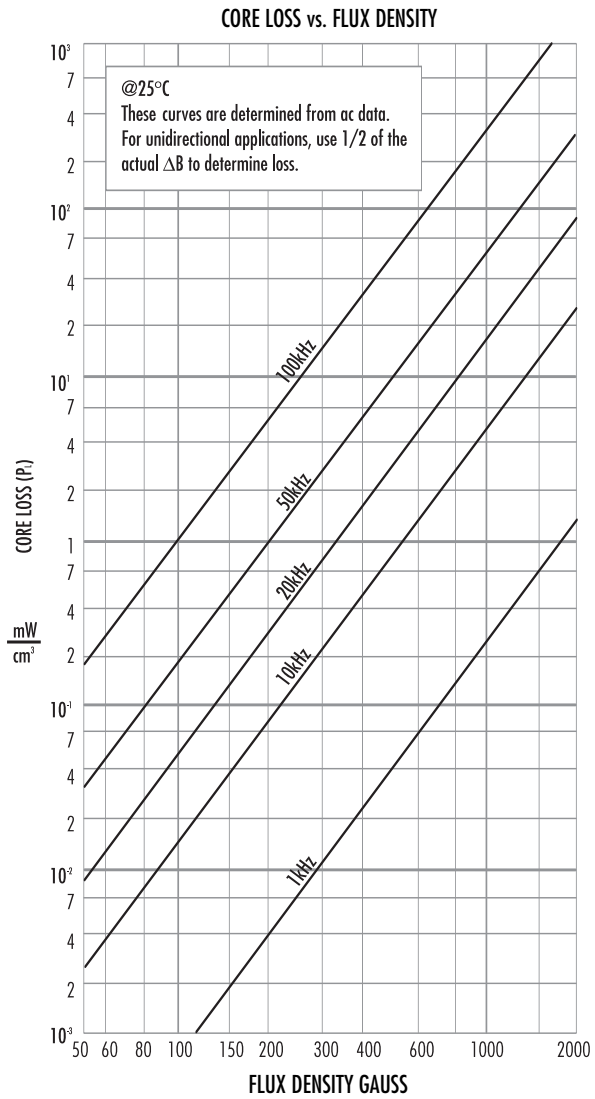
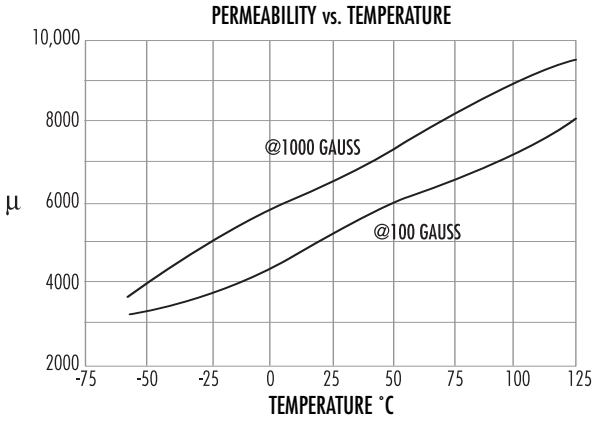


Saturation Flux Density - gauss 4,300 (at 15 oersted, 25°C) (430 mT)  
 Coercive Force - oersted . . . . . 0.1 (8A/m)  
 Curie Temperature . . . . . 140°C  
 Disaccommodation Factor . . . . .  $<3.0 \times 10^{-6}$

NOTE: The core loss curves are developed from empirical data.  
 For best results and highest accuracy, use them. The formula on page 3.10  
 yields a fair approximation and can be useful in computer programs.

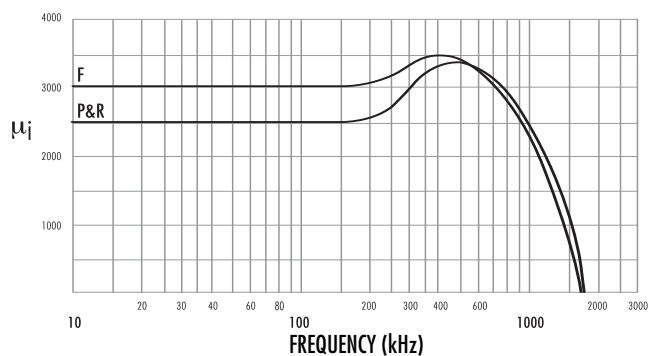
$\mu_i$  5,000  $\pm 20\%$



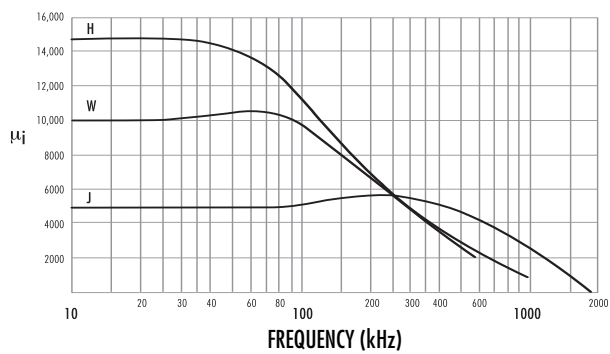
See Page 3.11 for B-H Data

## Material Curves

GRAPH 1 - FREQUENCY RESPONSE CURVES

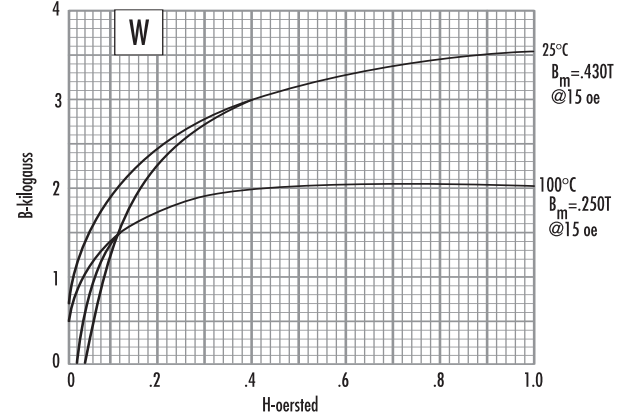
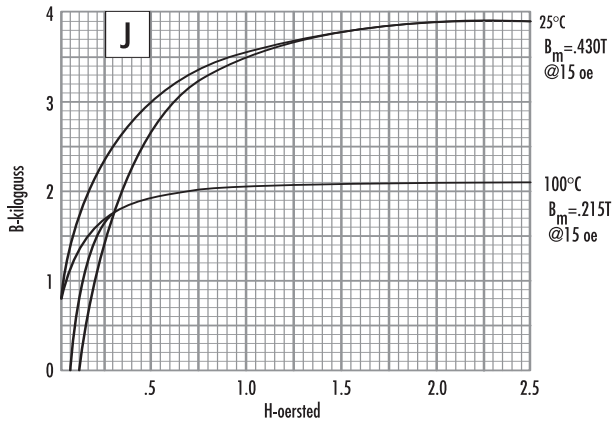
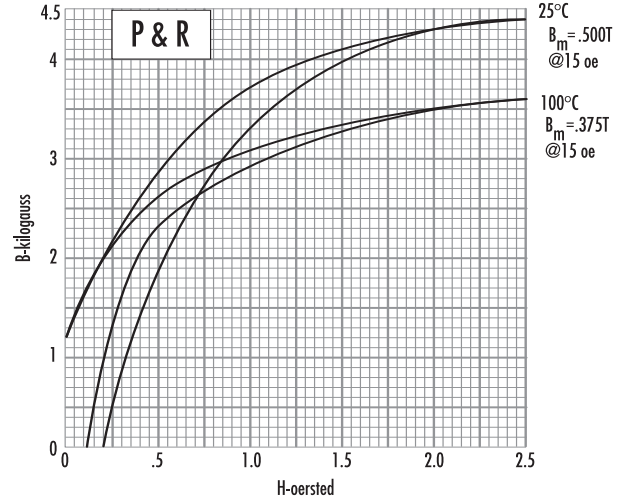
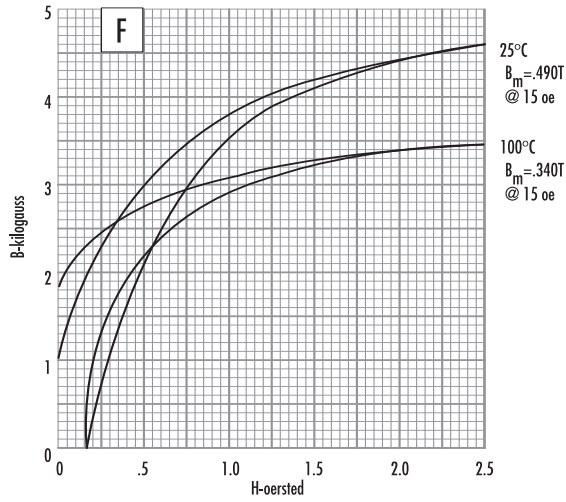


GRAPH 2 - FREQUENCY RESPONSE CURVES



# Materials

## B vs. H Curves (dc)



### CONVERSION TABLE

MULTIPLY NUMBER OF	BY	TO OBTAIN
Oersteds	79.5	A/m
Oersteds	0.795	A/cm
Gausses	0.100	milli Teslas
Gausses	$10^{-4}$	Teslas
Teslas	$10^4$	Gausses

## Core Loss Equation

Included on pages Pages 3.4-3.9 are material characteristics for the various Magnetics power and inductor materials. For computer programming purposes, the core loss curves can be represented by the equation below.

The factors indicated in the chart are split into discrete frequency ranges, so that the equation offers a close approximation to the core loss curves on the above pages.

$$\text{CORE LOSS EQUATION: } P_L = af^cB^d$$

P is in mW/cm<sup>3</sup>  
B is in kG  
f is in kHz

FACTORS APPLIED TO THE ABOVE FORMULA

		a	c	d
R Material	f < 100 kHz	0.074	1.43	2.85
	100 kHz ≤ f < 500 kHz	0.036	1.64	2.68
	f ≥ 500 kHz	0.014	1.84	2.28
P Material	f < 100 kHz	0.158	1.36	2.86
	100 kHz ≤ f < 500 kHz	0.0434	1.63	2.62
	f ≥ 500 kHz	7.36 * 10 <sup>-7</sup>	3.47	2.54
F Material	f < 10 kHz	0.790	1.06	2.85
	10 kHz ≤ f < 100 kHz	0.0717	1.72	2.66
	100 kHz ≤ f < 500 kHz	0.0573	1.66	2.68
	f ≥ 500 kHz	0.0126	1.88	2.29
J Material	f ≤ 20 kHz	0.245	1.39	2.50
	f > 20 kHz	0.00458	2.42	2.50
W Material	f ≤ 20 kHz	0.300	1.26	2.60
	f > 20 kHz	0.00382	2.32	2.62
H Material	f ≤ 20 kHz	0.148	1.50	2.25
	f > 20 kHz	0.135	1.62	2.15

## Characteristics

			INDUCTORS & POWER TRANSFORMERS			EMI/RFI FILTERS & BROADBAND TRANSFORMERS		
			R	P	F	J	W	H
Initial Permeability	$\mu_i$	—	2,300 ± 25%	2,500 ± 25%	3,000 ± 20%	5,000 ± 20%	10,000 ± 30%	15,000 ± 30%
Maximum Usable Frequency (50% roll-off)	f	MHz	<1.5	<1.2	<1.3	<1	<0.25	<0.15
Relative Loss Factor	$\frac{\tan \delta}{\mu_{iDC}}$	$10^{-6}$			<8 (100kHz)	<20 (100kHz)	<7 (10kHz)	<15 (10kHz)
* Curie Temperature	$T_c$	°C	>230	>230	>250	>140	>125	>120
* Relative Temp. Factor -30°C to +20°C +20°C to 70°C	/°C	$10^{-6}/°C$						
* Flux Density @ 1,194 A/m (15 Oe)	$B_m$	G mT	5,000 500	5,000 500	4,900 490	4,300 430	4,300 430	4,200 420
* Remanence	$B_r$	G mT	1,100 110	1,100 110	1,200 120	1,000 100	800 80	800 80
* Coercivity	$H_c$	Oe A/m	0.18 14	0.18 14	0.2 16	0.1 8	0.04 3	0.04 3
Disaccommodation Factor	$D_F$	$10^{-6}$				<3	<3	<2.5
* Resistivity	$\rho$	$\Omega\text{-m}$	6	5	2	1	0.15	0.1
* Density	$\delta$	$\text{g}/\text{cm}^3$	4.8	4.8	4.8	4.8	4.8	4.9
Power Loss ( $P_L$ ) Sine Wave, in $\text{mW}/\text{cm}^3$ (typical)	25kHz 200mT (2,000G)	@25°C @60°C @100°C @120°C	130 85 70 85	120 90 95 130	90 160 240			
	100kHz 100mT (1,000G)	@25°C @60°C @100°C @120°C	140 100 70 90	125 90 125 165	100 180 225			
	500kHz 50mT (500G)	@25°C @60°C @100°C @120°C	375 300 250 300	300 250 275 350				
	700kHz 50mT (500G)	@25°C @60°C @100°C @120°C						
Available In:	Pot Cores		X	X	X	X	X	
	RS Cores		X	X	X	X	X	
	DS Cores		X	X	X	X	X	
	RM Cores		X	X	X	X	X	
	EP Cores		X	X	X	X	X	
	E, U Cores		X	X	X	X	X	
	EC, ETD Cores		X	X	X			
	PQ Cores		X	X	X			
	Toroids		X	X	X	X	X	X
	Blocks					X		

Note: These characteristics are typical for a 42206 size (22.09mm O.D.) toroid. Specific core data will usually differ from these numbers due to the influence of geometry and size. Characteristics with a \* are typical.