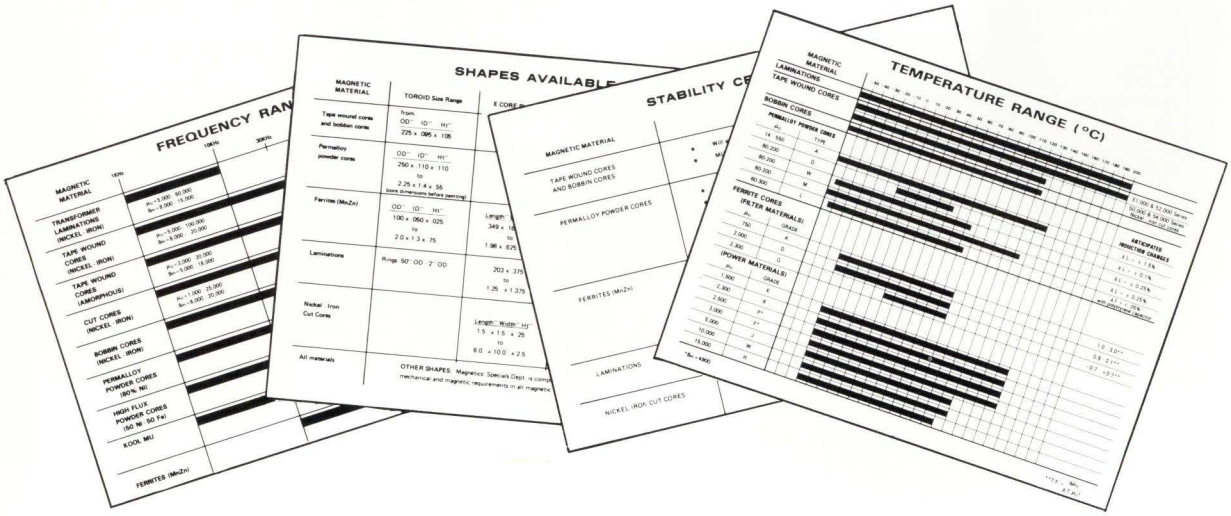
MAGNETICS®
Division of Spang & Company

BULLETIN NO. CG-2A

Technical Bulletin

For Designers of Chokes, Coils, Inductors, Filters and Resonant Circuits



FREQUENCY — TEMPERATURE — GEOMETRY — STABILITY

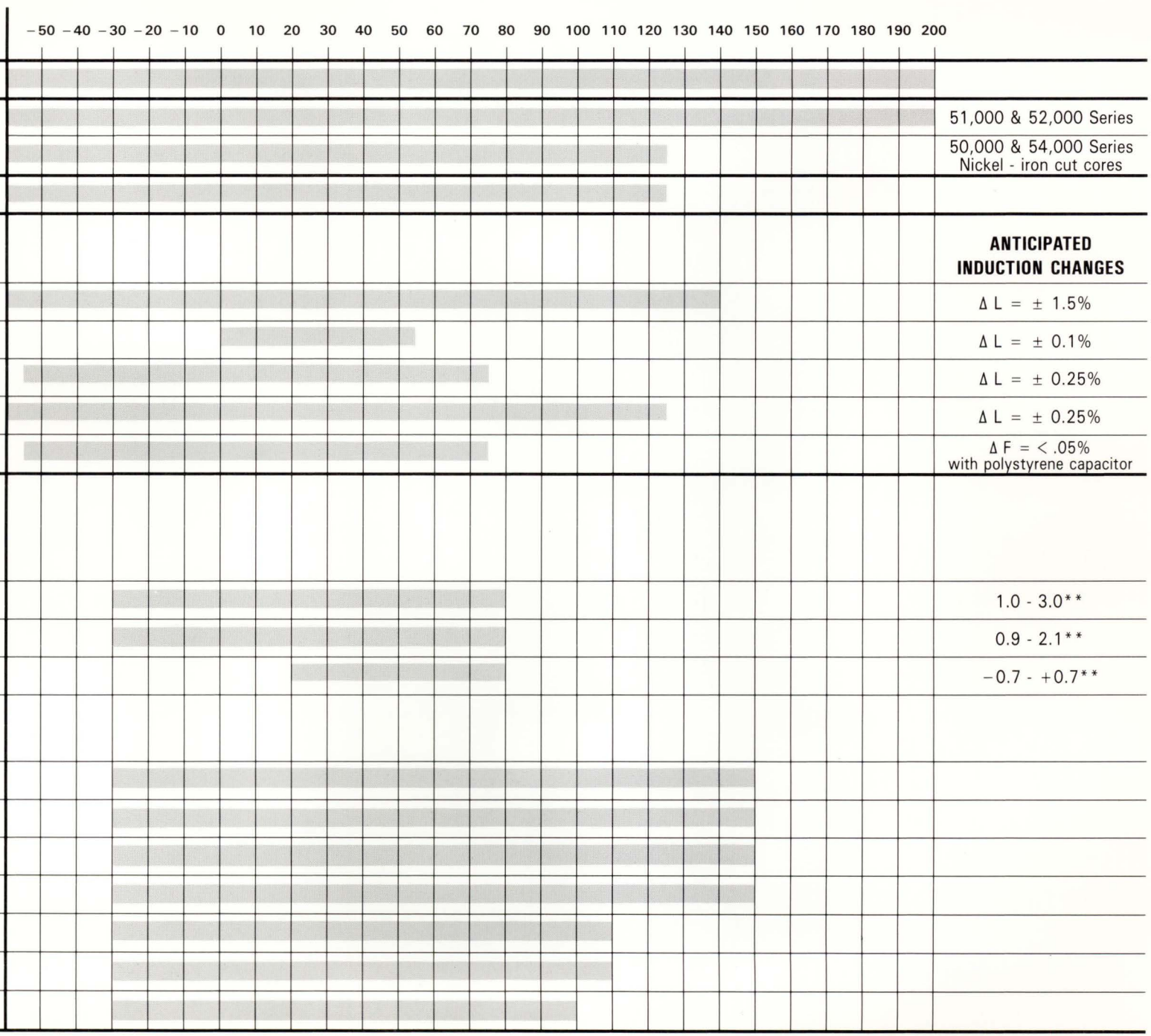
. . . . . Four major variables that influence performance of magnetic components. Magnetics handy reference charts will help the designer select the magnetic component that precisely meets his needs. Magnetics complete line of cores and laminations offers freedom of choice.

Selection, of course, depends on the specific application involved. Tape wound and bobbin cores are generally used in square loop applications such as inverters or magnetic amplifiers. Permalloy powder cores and ferrites, having linear characteristics, are primarily used in chokes, coils, inductors, filters, resonant circuits, and transformers; there are also certain varieties of tape cores that could be used in these applications. These charts will help define your needs, and specific data on each family of products is available upon request.

FREQUENCY RANGE

MAGNETIC MATERIAL	1KHz – 10KHz	10KHz – 100KHz (30KHz)	100KHz – 1MHz (200KHz)	1MHz – 2MHz
TRANSFORMER LAMINATIONS (NICKEL - IRON)	μ_o = 5,000 - 60,000 Bm = 8,000 - 15,000			
TAPE WOUND CORES (NICKEL - IRON)	μ_o = 5,000 - 100,000 Bm = 8,000 - 20,000			
TAPE WOUND CORES (AMORPHOUS)	μ_o = 3,000 - 20,000 Bm = 5,000 - 16,000			
CUT CORES (NICKEL - IRON)	μ_o = 1,000 - 25,000 Bm = 8,000 - 20,000			
BOBBIN CORES (NICKEL - IRON)		μ_o = 5,000 - 100,000 Bm = 8,000 - 15,000		
PERMALLOY POWDER CORES (80% Ni)		μ_o = 14 - 550 Bm = 7,000		
HIGH FLUX POWDER CORES (50 Ni - 50 Fe)		μ_o = 14 - 160 Bm = 14,000		
KOOL MU		μ_o = 60 - 125 Bm = 10,000		
FERRITES (MnZn)			μ_o = 750 - 15,000 Bm = 3,500 - 5,000	

TEMPERATURE RANGE (°C)



*Bm = 4900

**$T.F. = \frac{\Delta \mu_o}{\Delta T \, \mu_o^2}$

SHAPES AVAILABLE

MAGNETIC MATERIAL	TOROID Size Range	E CORE Size Range	OTHER SHAPES	MISC.
Tape wound cores and bobbin cores	from OD″ ID″ Ht″ .225 x .095 x .105			
Permalloy Powder Cores **High Flux Powder Cores** **Kool Mu Powder Cores**	OD″ ID″ Ht″ .140 x .070 x .060 to 3.06 x 1.9 x .5 (core dimensions before painting)			
Ferrites (MnZn)	OD″ ID″ Ht″ .100 x .050 x .025 to 3.4 x 2.2 x .5	Length″Width″Ht″ .349 x .160 x .075 to 3.1 x 1.5 x .78	Pot Cores 5mm x 6mm to 45mm x 29mm. Machined blocks up to 6″ x 2-1/2″ x 3/4″	Special machined shapes and sizes
Laminations	Rings .50″OD - 2″OD	.203 x .375 to 1.25 x 1.375	Special shapes	DU, E-I, U-I, F, L Shapes also available
Nickel-Iron and Amorphous Cut Cores		Length″Width″Ht″ 1.5 x 1.5 x .25 to 6.0 x 10.0 x 2.5	**C Cores** Length″Width″Ht″ .5″ x .25″ x .125″ to 12.0″ x 14.0″ x 2.0″	
All materials	**OTHER SHAPES:** Magnetics Specials Dept. is completely equipped to supply special shapes for unusual mechanical and magnetic requirements in all magnetic materials.			

STABILITY CRITERIA

MAGNETIC MATERIAL	
TAPE WOUND CORES AND BOBBIN CORES	• Will withstand high shock and vibration • MIL Std. 202 Group 7
PERMALLOY POWDER CORES	• Excellent DC bias stability • Excellent AC flux density stability • Good frequency stability (Q values up to 250) • Narrow inductance tolerances (±8% in 2% groups) • Superior temperature stability (see temperature chart)
FERRITES (MnZn)	• Narrow inductance tolerances (±3% in gapped pot cores) • Excellent time stability (Disaccommodation factors as low as $1.5x10^{-6}$) • Very good frequency stability (Q values up to 800 in pot cores) • Good temperature stability • Good DC bias stability
LAMINATIONS	• μ_o stability depends on materials and shape. Not as stable as powder cores.
NICKEL-IRON CUT CORES	• Excellent DC bias stability • Will withstand high shock and vibration

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MPP Powder Cores • High Flux Powder Cores

KOOL MU® Powder Cores

Tape Wound Cores • Bobbin Cores

Ferrite Cores

Custom Components