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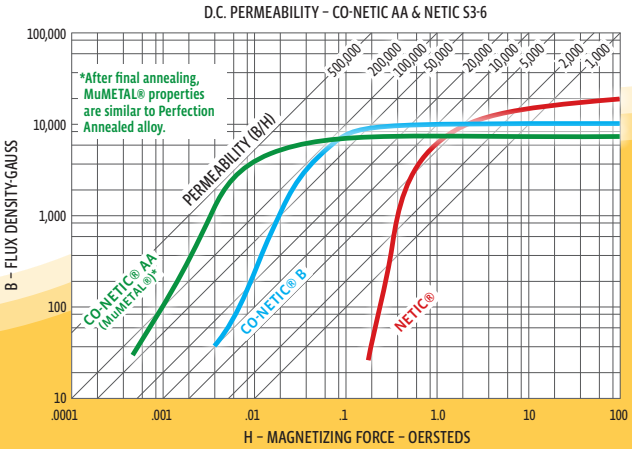
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MAGNETIC SHIELD CORP.

FORMULAS AND DESIGN CONSIDERATIONS

SATURATION OF SHIELDING MATERIALS

Saturation is the point at which a shielding material is full. No additional flux can be absorbed. In calculating shield design, the flux density (B) should be less than 7,500 Gauss for Co-NETIC® and less than 21,000 Gauss for NETIC® to avoid saturation. If the flux density is greater, thicker material or multiple layers are required. For high attenuation of low to moderate strength fields, a single layer of Co-NETIC® alloy is normally adequate. In high strength fields, light gauge Co-NETIC® may saturate and become less effective. If layers of NETIC® and Co-NETIC® are used in combination, to increase the flux capacity, the NETIC® material should always be placed nearest to the source of interference.



FLUX DENSITY ~ GAUSS (B)

Flux density of the shield material in Gauss *(ref. Saturation of Shielding Materials above)*

$B = (1.25 * D * H_o) / t$

D = diameter of shield *(approx. cylindrical size required to shield affected component)*
H_o = source (interfering) field in Gauss *(measured at the proposed shield location)*
t = thickness of shielding alloy *(material selected from the Lab Kit)*

ATTENUATION RATIO OF DESIGNED SHIELD

The shielding efficiency of a magnetic shield is specified as the Attenuation Ratio (reduction ratio). This is the ratio of measured field before shielding to that measured after shielding. Attenuation, measured in decibels (dB), is simply 20 times the logarithm to the base 10 of the shielding ratio.

A properly designed single layer Co-NETIC® shield of small size will easily provide 30 to 40 dB attenuation. Attenuation of 60 dB or more is attained by utilizing multiple layer shielding, such as found by using our three-layer Zero Gauss Chambers.

Typically, attenuation decreases in shields of large volume, unusual shape/configuration, or with large openings (leak points).

A simple formula for estimating attenuation ratio of a cylindrical shield is:

$A = (\mu * t) / D$

μ = known permeability of the shielding alloy *(at flux density B)*
t = thickness of shielding alloy *(material selected from the Lab Kit)*
D = diameter of shield *(approx. cylindrical size required to shield affected component)*

RADIO FREQUENCY (RF) SHIELDING

Our alloys provide interference control of H-fields, DC or AC to 100 kiloHertz, and differ fundamentally from RF shielding. Shielding for E-fields at radio frequencies (RF) above 100 kiloHertz involves use of high conductivity materials such as Copper, Aluminum or certain conductive coatings.

Because Co-NETIC®, MuMETAL® and NETIC® alloys are also conductive, they can shield high frequency (RF) fields, even though they are formulated specifically for low frequency magnetic fields. When both high frequency and low frequency fields are present, our alloys may be most effective if grounded and designed with proper RF shielding practices.

EP-101 ~ *Pickup Probes*



PART NO: EP-101A SHOWN

Three options available:

EP-101A ~ AC Magnetic Pickup Probe
Axial directional with 2-prong banana plug

EP-102A ~ AC Magnetic Pickup Probe
Axial directional with BNC connector

EP-102T ~ AC Magnetic Pickup Probe
Transverse directional with BNC connector

These field evaluator probes can be used with a digital volt meter (DVM) or oscilloscope to measure AC magnetic field intensities and attenuation ratios. These probes are accurate for direct measurements from 10Hz to 3000Hz in Axial or Transverse directions. Each probe is calibrated at Magnetic Shield Corporation.

Note: The EP-101A field evaluator probe is included with Lab Kit LK-120.

EF-401 ~ *Gaussmeter*



A cost effective, handheld, single-axis AC magnetic field meter that provides quick & reliable measurements of electromagnetic field (EMF) radiation generated by external sources like power lines, electrical wiring, motors, audio/visual equipment and other devices.

No probe is required – just position this Gaussmeter in the affected area. For detailed specifications and to order, go to: www.magnetic-shield.com. May be purchased separately, or as part of our Internet Special, saving you 10%.

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Catalog LK-5

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