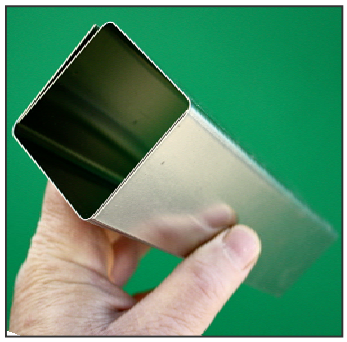
Application Note - NAS10-i

Very simple and economical magnetic shields

Our CP020-A4 sheet, made from .5 mm thick CO-NETIC AA alloy, makes fabricating effective shields easy, and at a low cost. We show two examples in here.

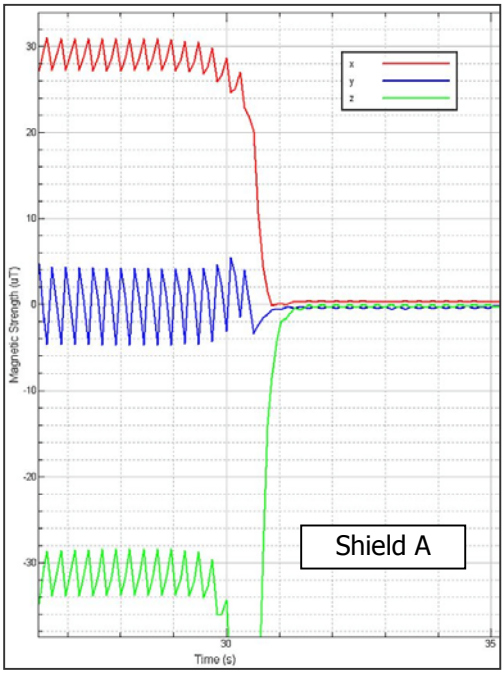
Shield A: Cylinder with interior diameter of 64 mm and length of 210 mm. It was made bending by hand a CP020-A4 sheet on a cylinder of 56 mm in diameter, without any other procedure for the joint of the borders.

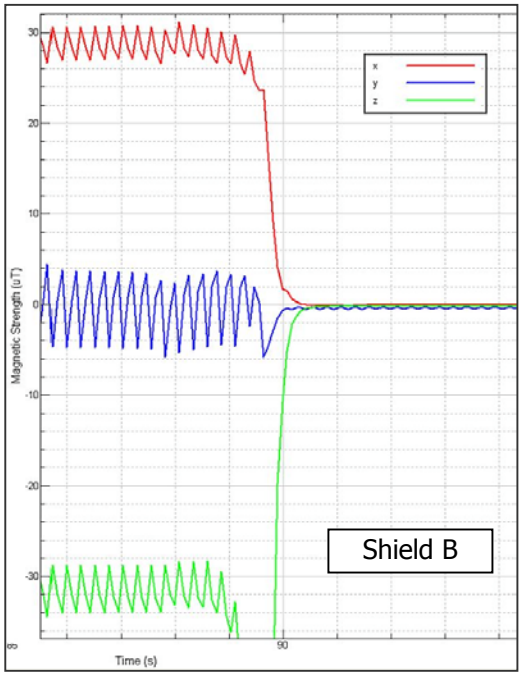


Screen B: Of rectangular cross section, with interior sides of 53 x 50 mm, and length of 210 mm. This is made from two "U" shaped pieces each one made with a half of a CP020-A4 sheet. The pieces were bent by hand on a square tube of 50 x 50 mm, with rounded edges. The interior bend radius is about 2 mm.

Test: A three-axis sensor was used at the centre of the shields. The local Earth's field was used as magnetic field, to which a 50 Hz component was added. The X-axis of the sensor was placed in North-South direction. The Z-axis is vertical. These magnetic measurements were made with an instrument Bartington Spectramag-6, with a probe Mag-03MS1000.

Results: In the figures below, it is clearly evident the moment at which the shields were placed around the sensor. In direct current (static field), attenuation ratios were about 100 times or more (≥ 40 dB) for any axis, for either shield. In alternating current of 50 Hz, the attenuation was about 30 times or more (≥30 dB) for any axis, for both shields.





Commentaries: For such simple shields, with open ends, made in minutes, with a cost of less than 70 Euro each, we can say that the results are good and useful in many practical cases. The attenuation would be greater in higher strength fields, up to 100 or 200 µT, since the material would operate with higher magnetic flux and permeability, without reaching saturation.
Shields more carefully made and with closed ends would yield even better results, particularly in alternating current.

Updated: 22-Jul-2016

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