

Spotlight on Sustaining Member

Amuneal Begins Shipping A4K Magnetic Shields



After two years of development and testing, Amuneal Manufacturing is now shipping magnetic shields for cryogenic applications fabricated from Amumetal 4K (A4K), its new, more cost-effective shielding alloy.

Developed in collaboration with Arcelor Mittal Stainless & Nickel Alloys of France, A4K addresses the growing need for competitively priced large scale magnetic shields for SRF cavities, test systems and other low temperature magnetic shielding applications.

Until Amuneal's introduction of A4K last year, Cryoperm 10® from Vacuumschmelze GmbH was the only commercially available shielding alloy for cryogenic applications. Due to its maximum coil width of approximately 10", the use of Cryoperm 10 for larger shields typically required welding together several strips, additional labor and secondary annealing operations.

Supplied in 24" wide x 120" long sheets for optimum laser processing and material utilization, and thicknesses of 0.020" (0.5mm), 0.040" (1.0mm) and 0.059" (1.5mm), Amumetal 4K has resulted in significant savings in material and fabrication costs to the customer.

Amumetal 4K performance has been compared with Cryoperm 10 by several independent research laboratories. Graphs 1 and 2 illustrate test results of Initial Permeability at 4K from DC to 60 Hz, as well as a BH Curve at 4K for the two materials at 60 Hz. The testing was

performed at Princeton University's Low Temperature Physics Lab.

The Amumetal 4K DC B(H) Curve (Graph 3) is based on testing of A4K rings in liquid helium at Arcelor Mittal's R&D Lab in France after fabrication and a special industrial heat treat cycle at Amuneal's facilities in Philadelphia.

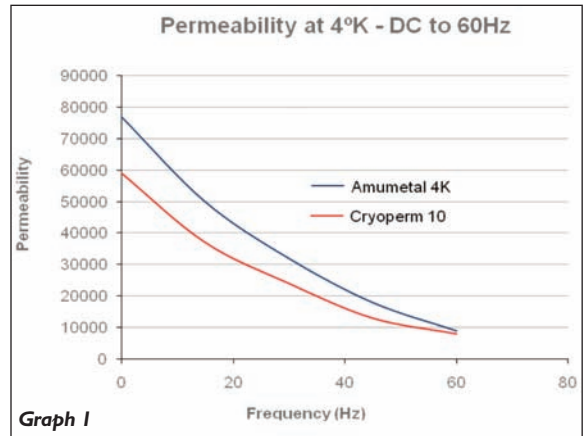
Amuneal has shipped A4K magnetic shields to universities, several DOE national laboratories, the National Institute of Standards and Technology and industrial companies and research institutes in the US, Canada, Europe and Asia.

These shipments include small diameter shields for SQUID sensors and dilution refrigerator systems to large diameter and length inner magnetic shields for SRF cavity vertical test systems and multi-cavity cryomodules.

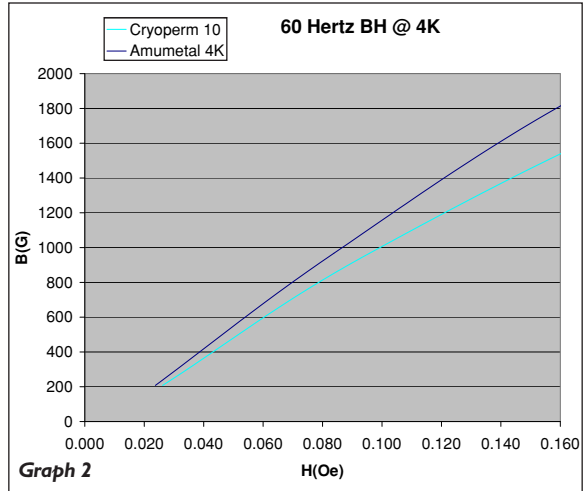
In addition to ongoing material testing, Amuneal has supplied full-size A4K magnetic shields to several customers in the US for testing at liquid helium temperature and comparison with shields previously supplied from Cryoperm 10. See Figure 1.

As data becomes available, the company will continue to provide this information to its A4K customer base and update its website.

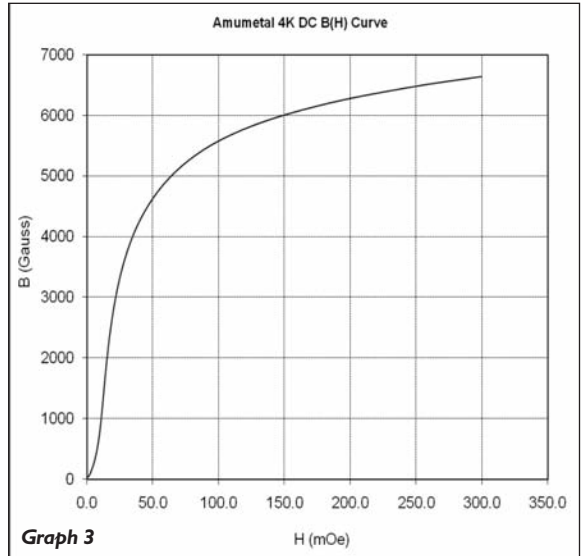
For more information about Amumetal 4K or to discuss your specific application, please visit www.amuneal.com or contact Amuneal President Larry Maltin, larrym@amuneal.com or Stuart Koch at stuartk@amuneal.com, 800/755-9843.



Graph 1



Graph 2



Graph 3

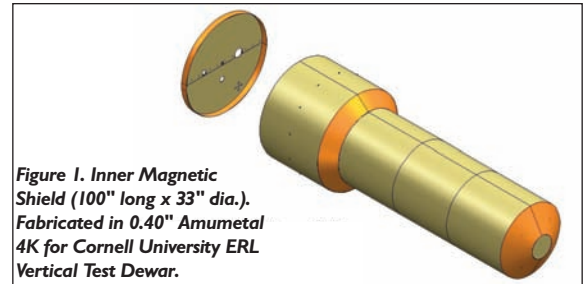


Figure 1. Inner Magnetic Shield (100" long x 33" dia.). Fabricated in 0.40" Amumetal 4K for Cornell University ERL Vertical Test Dewar.