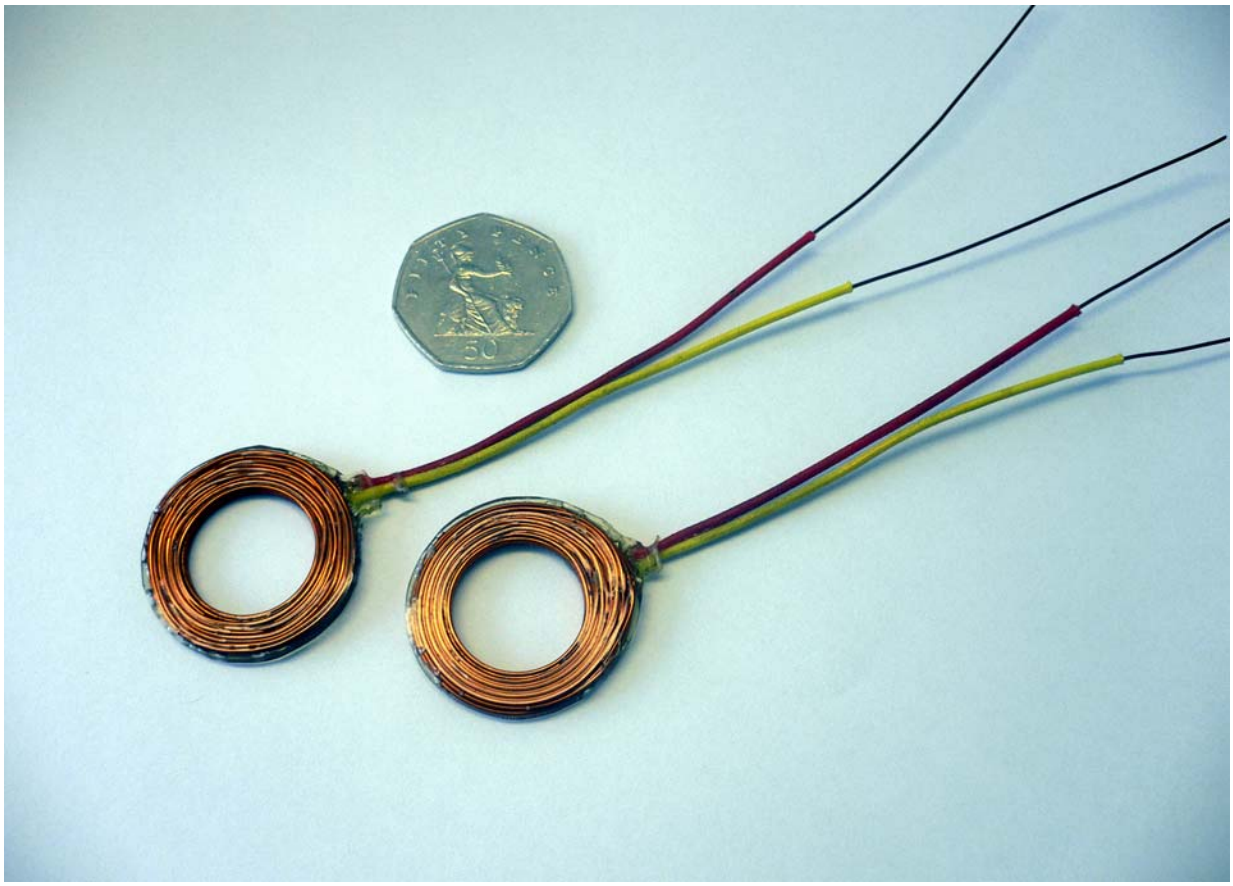
PRESS INFORMATION

DERITEND PULLS OUT THE STOPS FOR THE UNIVERSITY OF SHEFFIELD, PROVIDING HIGH PRECISION COILS FOR PRESTIGIOUS MICE EXPERIMENT.



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Special miniature precision solenoid coils offer positioning accuracies of ~ 0.0508mm in experiment to understand matter-antimatter symmetry in the universe.

Deritend's Pre-formed Windings division has made a major contribution to the University of Sheffield's participation in the Muon Ionisation Cooling Experiment (MICE), which is designed to understand matter-antimatter symmetry in the universe. Deritend pulled out all of the stops to design and manufacture 30 miniature precision solenoid coils at short notice for the prototype unit, and has since manufactured 90 coils for the full size version. The coils offer positioning accuracies of ~ 0.0508mm and can operate in high radiation and vacuum environments.

"The University of Sheffield had done a bit of a trawl of coil manufacturers before they found us," said Vernon Fletcher, General Manager of Deritend's Pre-Formed Windings Centre based in Sheffield. The actual coils were manufactured at Deritend's Grimsby Engineering Works, Kevin Parrott, General Manager at Grimsby, adds: "The major problem they had was tolerances: these were so exacting that other manufacturers didn't want to commit themselves. However, with our track record of manufacturing special coils – up to 12 tonnes in some cases - we saw the project as a challenge, not only because of the tolerances, but also because we had so little time for manufacture. In the end we managed to achieve both objectives, enabling the project to be commenced on time."

…more…

The MICE experiment is an essential step in accelerating R&D towards the realisation of a neutrino factory, in which an intense neutrino beam is obtained from the decay of muons in a storage ring. Neutrino factories are the ultimate tools for precision studies of neutrino oscillations and of leptonic charge-parity (CP) violation, a measurement that might prove decisive in understanding the matter-antimatter asymmetry of the universe.

Sheffield's contribution to the MICE experiment is the design and construction of a target to produce the required muons from the ISIS beam, the world's most powerful source of pulsed neutrons and muons, which is located at the Rutherford Appleton Laboratory in Didcot near Oxford.

Since the normal uses of the ISIS beam will continue in parallel to the MICE experiment, the target mechanism must cause as little disruption to the ISIS beam as possible: It needs to dip into the beam halo by around 5mm for 2ms (or less) before it is extracted

The target is dipped in and out of the ISIS beam using a linear drive. This consists of a shuttle made of magnetic material, which sits inside the series of coils manufactured by Pre-Formed Windings. When a current is passed through these coils they induce a force on the shuttle, the direction of which depends on the direction of the current in the wires. In this way it is possible to move the shuttle, and its attached target, backwards and forwards inside the coil assembly, dipping it into and out of the beam.

For more information regarding mice see:

http://www.cerncourier.com/main/article/45/4/1/1
And
http://www.shef.ac.uk/physics/research/pppa/research/mice/micework.php

About Deritend's Pre-Formed Windings Division

Pre-formed Windings, founded in 1968, is part of The Deritend Group Ltd. Based in Sheffield, UK. Pre-formed Windings produces a variety of types of coils for end users, repairers and OEM's around the world. The Coils are for various AC and DC applications including High Voltage Motors and Generators and Traction Motors. The division offers extensive capabilities, such as the ability to respond at very short notice, specialised coil design, 24-hour manufacturing, technical support and experience of export logistics.

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