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Stranded Superconducting Cable of Improved Design

A lightweight, stable, high-current superconducting cable has been developed and tested in a superconducting (liquid helium cooled) magnet made with the cable. The design features the use of a substantial amount of aluminum wire interspersed with the superconductor strands. The advantages of aluminum are its low magnetoresistance coefficient, and, consequently, its higher electrical conductivity than copper at 4.2°K over a wide range of magnetic fields; its ability in the highly pure state to self-anneal at room temperature, so that reductions in electrical conductivity due to the winding stresses are avoided; its light weight; and its low thermal capacity. The latter results in reduced cooldown costs.

Notes:

1. The principles applied to this cable and magnet design are applicable to a wide range of superconducting cables and magnets. 2. Inquiries concerning this innovation may be directed to:

Office of Industrial Cooperation

- Argonne National Laboratory
- 9700 South Cass Avenue
- Argonne, Illinois 60439
 - Reference: B70-10070

Source: J. Brooks and C. Laverick of Particle Accelerator Division, G. Lobell of Central Shops,

- and J. Purcell of
- High Energy Physics Division

(ARG-90108)

Patent status:

Inquiries concerning rights for commercial use of ³ this innovation may be made to:

Mr. George H. Lee, Chief Chicago Patent Group U.S. Atomic Energy Commission Chicago Operations Office 9800 South Cass Avenue Argonne, Illinois 60439

Category 01

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