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Technology Opportunity




Solderless Joint Technology

This is a simple, yet novel, device that eliminates the need for any type of solder when joining two large cables. The Solderless Joint Technology will immediately save hundreds of thousands of dollars in manufacturing costs, as well as minimize the risk to the entire multi-million dollar superconducting magnet system. This device has been fabricated and tested by the team in the laboratory, and has yielded amazing results.

Applications

This device's primary purpose is to form an electrical joint between two cable-in-conduit conductor wires, such as that typically used in superconducting magnets.

Advantages

- The fabrication technique is simple, inexpensive, quick, and designed to last as long as the CICC wire itself.
- This device has displayed minimal electrical resistance compared to its predecessor, which allows a magnet to retain more power.
- Eliminates the need for solder, which is messy and leaves gaps in the electrical seal.
- Eliminates the need to handle the magnet after it has been heat treated, which lowers the risk to the brittle multi-million dollar magnet.
- Unlike previous methods, this joint technology will not need to be frequently maintained or replaced over the life of the magnet.

Technology

This invention eliminates the need for solder by placing wires in a compression box that seals them between a novel cradle of steel and copper. These cradles are compressed by a novel steel tool which sandwiches the wires under extreme pressure. The steel housing is then welded together and heat treated for over eight days. This creates a vacuum-like seal, similar to solder, yet cheaper, higher performing, and with a longer lifespan.

Technology Opportunity

The Inventors

Thomas Painter Received a bachelor's degree from Pennsylvania State University in 1987 and a master's degree from Massachusetts Institute of Technology in 1989. He has worked on the engineering, design, fabrication, installation and test of the US Demonstration Poloidal Coil at the Japan Atomic Energy Research Institute. He currently works with superconducting magnets and cryogenic systems at the National High Magnetic Field Laboratory.

For Licensing Opportunities Contact

Office of IP Development & Commercialization
2010 Levy Avenue, Suite 276-C
Tallahassee, FL 32306-2743
Jack Sams / E-mail: jsams@fsu.edu
Ph: (850) 645-0048
Fax: (850) 644-3675

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OFFICE OF IP DEVELOPMENT & COMMERCIALIZATION
www.techtransfer.fsu.edu