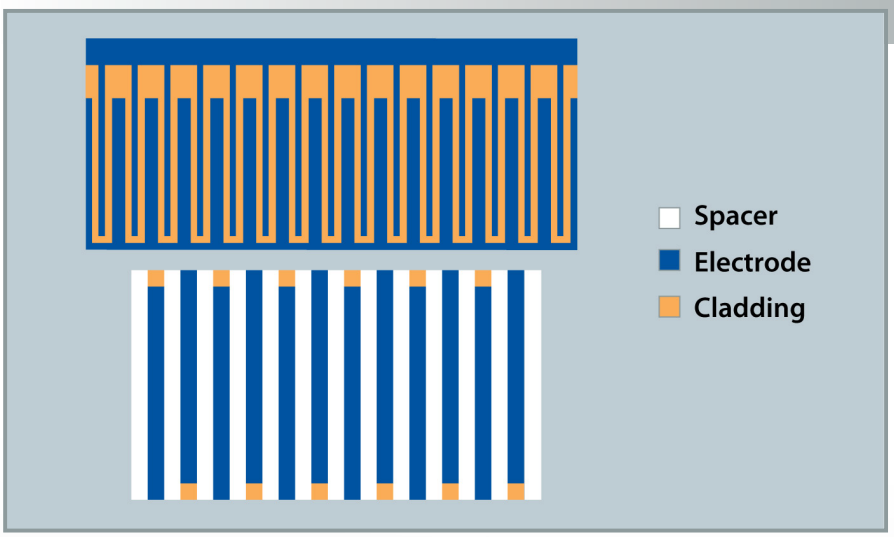
Clad Fiber Capacitor and Fabrication Method

UT-B IDs 200902218, 200902221



Technology Summary

Using glass and high performance polymer technology, an ORNL researcher developed a method for producing energy storage capacitors with high power density and the ability to operate at high temperatures. Conventional capacitors have low power densities and are limited to low temperature operations.

The invention uses a drawing/pulling technique to form capacitors out of glass or polymer fibers. The drawn/pulled fibers can be used to making clothing fabric with an energy storage capacity, or wound around a solid form. The capacitance of the fabric or form will vary according to the diameter of the dielectric layer, the length of the fibers, and the number density of the item.

The invention features a hexagonal lattice structure with coaxial fiber components. A preform contains an electrode made of conducting and semiconducting or high dielectric capacity materials. The clad over the inner electrode and the spacer between two electrodes are dielectric materials made of glass or a high performance polymer. Once the preform is assembled, it can either be stacked or used as is to make a continuous fiber with a well-defined coaxial form.

Advantages

- Increases potential for high storage density capacitors
- Increases potential for capacitors that operate at high temperature

Potential Applications

- High temperature, high power density applications
- Power electronic circuits and fibers in transportation, space, and defense industries

Patent

Application in preparation

Inventor

Enis Tuncer
Fusion Energy Division
Oak Ridge National Laboratory

Licensing Contact

Gregory C. Flickinger
Technology Commercialization Manager, Energy and Engineering Sciences
UT-Battelle, LLC
Oak Ridge National Laboratory
Office Phone: 865.241.9485
E-mail: flickingergc@ornl.gov

PARTNERSHIPS