

Licensable Technologies

Improved Radio/Microwave Dielectric Films

Applications:

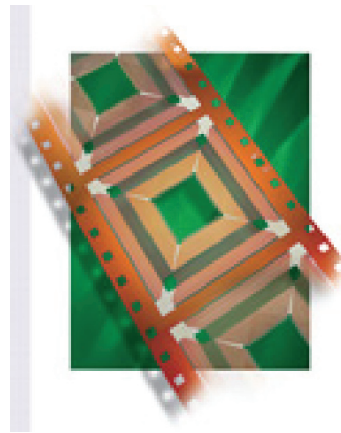
- High performance radio and microwave electronics
- RADAR
- Military electronic countermeasures
- Cellular phones
- Computer DRAM chips
- Communication antennae

Benefits:

- Low dielectric loss, which leads to lower heat loss and longer battery life
- High tunability, which allows for many different electronic applications

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Summary:

Dielectric films are among the most common of materials in electronic devices. The total dielectric material market fluctuates between \$1 billion and \$2 billion annually. Microwave devices need dielectric materials for many components such as voltage-tunable filters and phase shifters. In turn, these components are used in RADAR and electronic countermeasures in a military setting. In the civilian market, these films are used in many applications such as cellular phones.

The standard dielectric material in use, barium strontium titanate (BSTO), exhibits high dielectric loss. This means that a large amount of energy is

lost as heat. When BSTO heats up, more power is required and cooling may be necessary. Dielectric loss becomes significant in high performance radio and microwave electronics such as those used in the defense and aerospace industries.

Los Alamos National Laboratory's methods produce dielectric composites with tunable dielectric constants and tunable capacity, which also exhibit very low dielectric loss. Our improved dielectric films can be positioned to replace BSTO in applications in which preventing either energy loss or heat generation is critical. More broadly, our improved radio/microwave dielectric films may be used simply to lower energy usage of devices such as cell phones and computer DRAM (dynamic random access memory) chips.

Low dielectric-loss materials are also generally needed for efficient microwave and radio communication. One potential market scenario would have our dielectric film used broadly in the multibillion-dollar electronic communications market as a replacement for BSTO.

Development Stage:

Working material available

Intellectual Property Status:

Issued U.S. Patent No. 6,444,336

Licensing Status:

Exclusive and non-exclusive licenses available.