



# “FOR NARTE MEMBERS ONLY” (A Look At Conductive Fabrics)

*It is a privilege to write this new column for the NARTE News. I'll keep it useful and lively. These are my own personal views, not NARTE policy. Comments and dissenting opinions are encouraged. This is how we all learn.*

**E**lectrically conductive fabrics are a fairly new product. While designed for electromagnetic shielding, they have many other potential uses, too. They reflect radar and infrared signals, and one could probably make antennas out of them. They certainly could make handy, fold-up ground planes. BEMA, Inc., a world leader in its field, uses them to make shielded tents.

At TEMPEST INC. we have tested samples of most (possibly all) of the conductive fabrics currently being made in the world. They come in a wide variety.

Some look like satin. Others are stretchy, like T-shirt material, and others feel more like the burlap that is sometimes used for wallpaper.

I won't go into details about their shielding effectiveness in dB, but they can be used to make effective shields at UHF frequencies. Working with them requires special techniques. They are not like metal sheets and foils.

## Fabric vs. Metal Sheets

Why use conductive fabric instead of metal sheets? Fabrics are expensive. No one would argue that a great deal more galvanized steel could be purchased for the same price, and steel makes a better shield. But consider this: fabrics can be folded up. Since they are floppy, they can sustain the effects of vibration better than metal sheets or foils can.

Testing them has some unique pitfalls. This is why the same fabric sometimes gets different results when tested by different, perfectly competent, Electromagnetic Compatibility laboratories.

We have worked out these pitfalls using proprietary techniques. Consequently, we are getting repeatable, consistent results, but I now have a couple of new gray hairs!

## Fabric Production

Most conductive fabrics are made essentially the same way: a standard polyester fabric is plated or coated on the outside with a metal, such as nickel. The surface conductivity is good, but there are questions about the long-term effects of abrasion. There are also questions about allergic reactions for those people who are allergic to nickel. This could be a problem if you are manufacturing something like a shielded vest. Testing for allergenic properties requires special protocols and clinical trials. We have not been asked to do this yet.

One firm makes a conductive fabric that is unique. Using patented, advanced technology they take hair-thin, silver plated copper wires and they wrap them with polyester to form a unique type of thread. (Threads are called “yarn” in the fabric industry.) This yarn is then woven into a fabric that you have to see to believe. Most EMC engineers don't believe it is conductive until they try it. It looks and feels like regular cloth, and comes in a variety of colors. It provides good shielding effectiveness, but like all the other fabrics it is tricky to work with and test.

Just for fun, I washed a sample with detergent in really hot water (190 degrees F). I let it soak for a few hours, let it air-dry, and then re-tested its shielding effectiveness. I found no difference.

The fabric is rugged and, as far as I can tell, nearly fireproof. The only way I have been able to get it to ignite is by dipping it in oil first.

The fabric is made in Switzerland by Snowtex AG, part of a 100-year-old family owned firm that also makes seat covers for high-end cars like Volvo and Mercedes.

We have lots of this stuff left in the lab. If you would like to see a sample, send me an e-mail. I will be happy to send small samples to NARTE MEMBERS ONLY. ☺

Regards,  
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## NARTE Prepares for, Tutors and Proctors Tests Around the World



*Shannon Reynolds (left) and Sandy Felone prepare your new certificates for mailing from NARTE headquarters. Photo by Laura Holmberg.*



*Dr. Jim Whalen, a regular and long time NARTE exam development specialist, conducting a tutorial at an IEEE EMC Symposium. Photo by Dick Ford.*



*(Left-right) Arlene and Russ Carstensen, and Don Sweeney, during an EMC exam at IEEE EMC Symposium (Seattle). Photo by Dick Ford.*

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