New Ink for Printed RFID Antennas

A startup says it has developed highly conductive inks that can be printed on paper at high speeds.

Feb. 5, 2003 - Parelec Inc., a startup that makes conductive inks and pastes, says it has developed an ink that enables companies to print highly conductive RFID antennas on paper and polyester. Parmod VLT is commercially available and is being marketed as a way to produce low-cost RFID tags at high speed.

Today, most RFID antennas are made from metals. Acid is often used to etch away some material to improve conductivity. That results in hazardous waste, an extra step in the process of creating an RFID tag, and additional costs.
Steve Ludmerer, president of Rocky Hill, NJ-based Parelec, says Parmod ink can help reduce the cost of RFID tags because the antenna can be printed and attached to the chip during the commercial printing process.

"We have demonstrated the ability to attach components to our printed circuitry in one operation," he says. "To do the same thing with RFID, we need the right metallurgy on the chip and some other developments, but the concept is clearly there."

A number of companies are working on developing techniques for printing RFID antennas using conductive inks. Flint Ink, one of the world's largest makers of commercial inks, recently announced it was investing millions in a new research facility for conductive inks (see Flint Bets on Printed RFID Antennas).

Ludmerer says Parmod VLT is different because instead of suspending silver and other metal particles in a polymer, Parmod uses an organic base that decomposes and leaves an antenna that is more than 99 percent metal. The company claims that because of this, its printed antennas are three to 10 times more conductive than polymer-based inks.

Greater conductivity means the tag can be read from further away than a tag with a polymer-based antenna. It also should reduce the cost of the antenna because less ink is needed to create an antenna with same performance level.

Parelec was printing its antennas at high temperatures on a steel or Teflon Web and then transferring them to a paper or polyester substrate when they cooled. The new technology eliminates that step by enabling the inks to be printed and dried on paper at around 130 degrees centigrade.

Parelec is focusing on the RFID industry because Ludmerer believes that companies will move away from more-costly etched antennas. He says the first large-scale applications will likely be closed-loop ticketing systems, such as mass transit systems or large ski resorts. Eventually, smart labels with printed antennas could be used in the supply chain and then on retail products.

So far, no RFID manufacturers have signed up to use the inks, but Ludmerer says Parelec is in the advance stages of qualifications with several potential customers. RFID label makers, no doubt, want to be sure that antennas printed with Parmod ink are not only cheaper, but also perform as well or nearly as well as etched antennas.

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