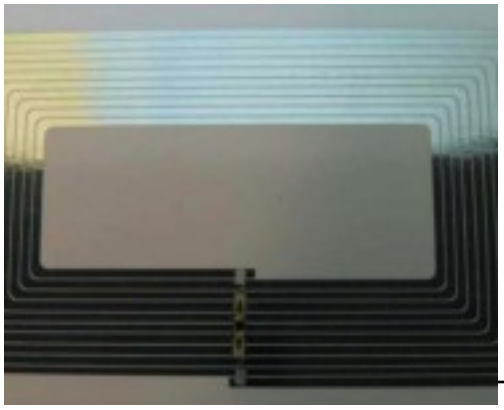
Scientists Print Cheap RFID Tags On Paper

A way to print Radio Frequency Identification (RFID) chips right onto paper has been discovered by a team of scientists from University of Montpellier.
The technique uses a thermal evaporation process to deposit of thin aluminium coil antennas on sheets of paper which can later be used to create packaging or printed material. Researchers claim that this works out to be cheaper than any other method of producing RFID tags, allowing the technology to replace both barcodes and QR codes.

Circuits everywhere

RFID tags are an essential component of modern shopping and logistics and are found in everything from DVD cases to casino chips and even passports. They are used to prevent shoplifting, track pets and, if you live in London, your Oyster card has one at its core.



The tags can both store information and provide a way to track the item to which the tag is attached. Unlike barcodes, they use radio signals, which can be detected over a short range, without a visual contact between the tag and the reader device.

So-called “passive” RFID tags, using NFC (near-field communications) do not need a power source. The reader sends a signal, which induces a current in the tag, that is used to power a radio transmitter, sending a signal back to the reader.

Even passive, NFC-based RFID tags are relatively expensive when compared to barcodes, because they contain some electronics instead of just a printed image, so their use is not as widespread. The ability to produce tags at a fraction of the present cost, using a printing technique could change that.

According to the article published in International Journal of Radio Frequency Identification Technology and Applications, the thermal evaporation process makes the RFID tag cheaper, as it requires less metal than conventional designs. The scientists involved said using aluminium might reduce the costs of tagging with an RFID chip by as much as 80 percent.

Aluminium is a lot less expensive than copper or silver, which are used in some types of RFID tag. This is good news for inventory users operating millions of RFID tags in their systems.

“Prototypes are functional and easily detected by the reader; the next step is to optimize the design for each family of RFID chips,” said Camille Ramade, spokeswoman for the research team. ”This will significantly improve performance while maintaining the same low-cost technology on paper.”

RFID tags are not the only printable ultra-thin circuits. Last year, Norwegian technology company Thinfilm Film Electronics ASA developed a memory prototype embedded on a sheet of plastic.

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