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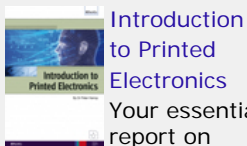
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How to Eat RFID



Printing and marking food is a very old idea from tattoos and branding from four thousand years ago to more recent attempts to print barcodes on this and that. Power Paper of Israel showed how smart patches could send tattoos into meat by iontophoresis - basically making the material porous by electrical stimulation. So printing RFID on food and medicines can scarcely be called original. However, this year, Eastman Kodak of the USA has taken the unfulfilled dream forward by patenting the use of printed barcodes to monitor such things as whether pills have been taken and when they were absorbed into the body ie the tag dissolved.

How can this be done? Silicon chips should not be eaten. Nor should RFID based on Surface Acoustic Wave SAW chips. Both are made on brittle sharp materials and some poisons can be involved. Unfortunately, the one hundred or so organisations developing printed transistors - that they call the "plastic chip" for RFID and other uses - are a long way from knowing how to spray the circuits directly onto pills or food. They are typically deposited on plastic film - again something that should not be ingested.

There is very early interest in biodegradable plastic film but that will take some time to prove. And then there is the question about whether biodegradable plastic should be eaten. It has not been developed with that in view.

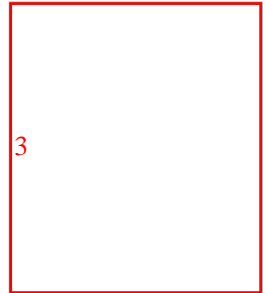
That leaves the so-called chipless forms of RFID beyond SAW and transistor circuits. Here many companies have come and gone, for such reasons as high reader costs, and/ or fairly high tag costs and/or short range and lack of standards. Some of the new candidates such as the ACREO of Sweden with PEDOT organic ink stripes and M-real of Sweden and Finland with polyanilene organic ink stripes also have very short range - a few millimeters. That would render them useless for monitoring a marked pill in the body.

However, the 60 MHz microwave interrogated inks from Vubiq of the USA and Inksure of Israel may be edible and it is claimed that they work at several meters through obstructions, though not completely independently of orientation. Interestingly, the alternative ink from Somark Innovations, interrogated at several meters by a different system, is claimed to be an FDA approved material. Perhaps they should be talking to Eastman Kodak because applications in surgery, compliance in medicine taking, food logistics and more may await them. Indeed the ultimate low cost item level tagging of food is to spray the RFID straight on.

Source top image: ACREO Sweden

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