Japanese company develops silver ink that requires no heat to harden

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An electronic circuit created through flexographic printing using the silver ink. Image: Tanaka Kikinzoku Kogyo K.K.

(PhysOrg.com) -- Consider for a moment, all the circuit boards that have been made, particularly those in the past few years. Most have two parts to them, not including the board itself. The first are parts that do things, like the computing that goes on in chips. The other part is the silver on the surface of the board that serves as a sort of wiring, connecting all the other parts together. Nowadays, the silver is printed onto the circuit board, a process that has become mechanized. But the thing is, the silver has to be made to harden to do its job, and that generally requires heating it. That may be changing though, as it appears a Japanese company called Tanaka Kikinzoku Kogyo K.K. has figured out a way to harden silver onto a surface using ultraviolet light instead of heat.

Everyone knows that silver is a pretty soft metal, but it's also amazingly conductive, and that's why it's used so much in electronics. The problem is, using heat to harden the silver reduces the number of materials on which it can be applied because it would cause them to melt. Thus, a new process that uses ultraviolet light at room temperature to harden the silver would allow silver ink to be printed and hardened onto virtually any surface, which might mean, the electronics industry is finally on the path to creating flexible and other exotic-material based electronic devices.

Product sample. Image: Tanaka Kikinzoku Kogyo K.K.

To print silver onto a surface, it first must be made into an ink of sorts, which typically involves making a resin (liquid material that hardens under certain conditions) that will not only stick to the surface to which it's being applied but allow for the ink to exist in a liquid state so that it can be squirted or squeezed out of a nozzle. And that apparently is the key to new ink, it's in the materials used in making the resin, though of course the company isn't divulging just what they've done to make that ink, as they prefer to reap some profits from their work. But the bottom line is, once the silver ink is laid or sprayed onto a surface, they shoot it

with an ultraviolet light and it hardens in just 0.3 seconds. And because a manufacturing process that uses ultraviolet light would be much cheaper and simpler than one that relies on heat, prices for such circuit boards should go down resulting in lowered prices for consumer products that use them.

More information: Press release

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