



THE Ames Laboratory  
Creating Materials & Energy Solutions

Creating  
**Materials & Energy**  
Solutions

## A green solution for the electronic age

### A lead-free solder invented by scientists at the Ames Laboratory in Iowa is used all over the world

Solder is the glue that holds many of our gadgets together. Unfortunately, much of the solder used today is made from lead. And lead is poisonous. When broken-down gadgets find their way to landfills, the lead contained in their solder and other parts can leak out. If enough lead leaks out, it can poison the ground water that people drink.

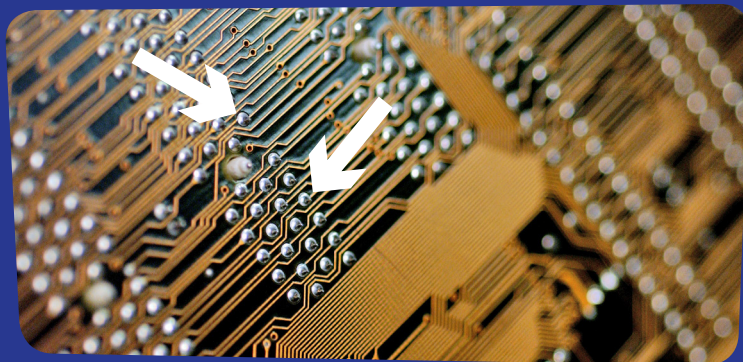
We keep throwing out more and more old computers, cell phones and other broken gadgets. Concerned about this growing problem of discarded electronics, some countries in Europe have already limited the use of lead in products sold there.

That's why scientists at the U.S. Department of Energy's Ames Laboratory worked so hard to invent solder that contains no lead. It wasn't

easy. Any kind of solder we use has to melt at a fairly low temperature, so it doesn't damage the delicate electronic parts it's gluing together. Secondly, it needs to last a long time and stand up to some pretty rough treatment. Thirdly, lead-free solder needs to cost about the same as solder containing lead.

After conducting many experiments, the scientists at the Ames Lab invented a lead-free solder that meets all three requirements. Their solder contains not just one metal but three, tin, silver and copper, all combined in just the right amounts.

Someday, the U.S. might ban lead in electronic devices, too. And that'll be a good thing, since the scientists at Ames Lab already have a green substitute that's even better.



The white arrows point to solder connections.

### BOOST YOUR SOLDER IQ

**What is solder?** Think of it as a kind of glue made from one or more metals. Solder melts at a low temperature so it won't harm the delicate parts it's gluing together.

**What's solder used for?** Just about every electronic device you can think of has solder in it, gluing together the wires and other parts so electricity can flow from one place to another and allow the device to work properly.

**What's solder made of?** For a long time solder was made using lead. But a new kind of solder made from tin, silver and copper was invented by the U.S. Department of Energy's Ames Laboratory in Iowa.

**Why get rid of lead?** Because it can be harmful to people and the environment.

**Will companies that make electronics want to use this safer solder?** A lot already do. In fact, more than 60 companies have received a special license to make and distribute Ames Lab solder to countries all over the world.

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