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**AMES LABORATORY/ IOWA STATE UNIVERSITY SCIENTIST
NAMED IOWA INVENTOR OF THE YEAR
Lead-free solder royalties surpass \$10 million mark**

AMES, Iowa – The Iowa Intellectual Property Law Association has named Iver Anderson, a senior metallurgist at the U.S. Department of Energy's Ames Laboratory and an Iowa State University adjunct professor of Materials Science and Engineering, as its 2006 Inventor of the Year.



The award is given to an Iowa inventor who has made the most outstanding contribution to Iowa through his or her invention. The award will be presented Friday, October 13, at a banquet in Des Moines. "I am honored to receive this award from such a highly qualified organization of intellectual property experts," said Anderson. "All really good things take a very long time to achieve, and this award is no exception."

Anderson developed a lead-free solder alloy consisting of tin, silver and copper that was patented in the United States in 1996 and 2001. Solder is the shiny metallic "glue" that holds electronic components on computer and other circuit boards and bonds other electrical connections. By some estimates, about 3,000 tons of electronic waste is discarded daily just in the United States, creating a huge threat to the environment. Responding to this same threat, on July 1 of this year the European Union began strictly limiting the amount of lead and other hazardous materials used in the circuitry of any electronic appliance sold. The European directive, as well as a similar commercial initiative in Japan, has prompted a dramatic increase in interest in Anderson's lead-free solder.

Licensed to over 50 companies worldwide, lead-free solder has generated royalties to date in excess of \$10 million according to Ken Kirkland, executive director of the ISU Research Foundation, who nominated Anderson for the Iowa Inventor of the Year Award. "The commercial success of the lead-free solder developed at Iowa State University is a direct reflection of our world-class scientists. This can only enhance our reputation. I expect the use of these products in global markets to increase over the next few years." said Kirkland.

In addition to its environmental advantages, Anderson's lead-free solder offers a lower melting temperature and greater strength than other lead-free solder alternatives. These properties are especially important in prolonged high-heat conditions, such as those found in computers and even cell phones. To combat brittleness caused by high-heat conditions, Anderson and his group have pursued additives to the tin-silver-cop-

per formula, including iron, cobalt, silicon, titanium, chromium, manganese, nickel, zinc and germanium, which are covered primarily under the 2001 patent. Some of this work has been funded by ISURF.

According to Anderson, cobalt and zinc appear to be the most attractive in terms of retained ductility and strength, and zinc also offers benefits in terms of solderability, ease of alloying and material cost. While the tin-silver-copper-zinc combination is covered under the original patent, additional testing will be needed to make the final selection.

“Iver Anderson’s work is a perfect example of the uniqueness a laboratory, such as the Ames Laboratory with its focus on materials research, can bring to bear on solving problems of national and international importance,” said Tom Barton, director of the Ames Laboratory. “I congratulate Iver for his important contribution to humankind.”

Anderson’s research initially was funded by the Department of Energy’s Office of Basic Energy Sciences, Materials Science and Engineering Division. Ames Laboratory is operated for the DOE by Iowa State University. The Lab conducts research into various areas of national concern, including the synthesis and study of new materials, energy resources, high-speed computer design, and environmental cleanup and restoration.

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Note to Editors: *If you’d like to see a demonstration of lead-free solder, arrangements can be made by contacting Kerry Gibson at kgibson@ameslab.gov, (515) 294-1405.*