



## Weblinks: Lead-Free Solders Research - Universities/Institutes

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The following are links to university/institute lead-free solders programs.

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UNIVERSITY/INSTITUTE	PROFESSOR/GROUP	WEBLINK	COMMENTS
<i>American Competitiveness Institute (ACI)</i>		<a href="#">Launch Site</a>	Offers access to numerous papers, legislative updates, project updates and links to organizations engaged in lead-free solder research.
<i>Ames National Laboratory / Iowa State University</i>	Iver Anderson	<a href="#">Launch Site</a>	Provides contact information, as well as a brief bibliography of selected publications.
<i>Arizona State University</i>	Nikhilesh Chawla	<a href="#">Launch Site</a>	Detailed information about Dr. Chawla's research interests, including Pb-free solders, as well as a bibliography of related papers.
<i>Chalmers University of Technology, Sweden</i>	Electronics Production and Packaging (SMIT Center)	<a href="#">Launch Site</a>	Home page of the Swedish operation of the Sino-Swedish Microsystem Integration Technology Center. Brief descriptions of current lead-free projects can be accessed via the "lead free soldering" and "nano solder paste development: links.
<i>City University of Hong Kong, Department of Physics and Materials Science</i>	Lawrence C M Wu	<a href="#">Launch Site</a>	Click on the "recent research output" link in Dr. Wu's biography accesses a bibliography of recent research, including projects in lead-free solder.
<i>Colorado School of Mines</i>	Center for Welding, Joining and Coatings Research	<a href="#">Launch Site</a>	"Mechanical Properties of Lead-Free Solders" and "Kinetics of Intermetallics Growth in Lead Free Solder Alloys Applied upon Copper Substrates" are listed as current projects.



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<i>Edison Welding Institute, Columbus, Ohio</i>		<a href="#">Launch Site</a>	Briefly describes activities related to Pb-free.
<i>Georgia Institute of Technology</i>	<b>CASPaR (Computer Aided Simulation of Packaging Reliability)</b>	<a href="#">Launch Site</a>	"Lead-Free Solder Reliability and Qualification" is listed under project summaries.
<i>Gumma University, Faculty of Engineering, Department of Mechanical System Engineering, Japan</i>	<b>Dr. Ikuo Shohji</b>	<a href="#">Launch Site</a>	Significant interest in lead-free solder research. A bibliography of Dr. Shohji's most recent projects can be found here: <a href="http://syllabus.jimu.gunma-u.ac.jp/customer/open/gyoseki/index_e.jsp?sUrl=kgsearch_e.jsp">http://syllabus.jimu.gunma-u.ac.jp/customer/open/gyoseki/index_e.jsp?sUrl=kgsearch_e.jsp</a>
<i>Helsinki University of Technology, Laboratory of Electronic Production Technology, Finland</i>	<b>Research and Development Projects</b>	<a href="#">Launch Site</a>	A brief description of the lab's lead free electronics project is provided on this page. Access the "Pb-Free Electronics" link on the research tool bar on the left of the page for more detailed descriptions, with additional resource links, to recent projects.
<i>Hokkaido Industrial Research Institute, Japan</i>	<b>Material Engineering Department</b>	<a href="#">Launch Site</a>	A more detailed description of lead-free solder research activities can be accessed by clicking the "new functional material" link and then scrolling about half way down the new page.
<i>Hong Kong University of Science and Technology, Center for Advanced Electronics System Packaging</i>	<b>Ricky Shi-Wei Lee</b>	<a href="#">Launch Site</a>	This link leads to Dr. Lee's personal web page which outlines his research interests. Additional (and more current) information on his projects can be found in the Hong Kong University faculty directory at <a href="http://research.ust.hk/index6.html">http://research.ust.hk/index6.html</a>



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<i>Integrated Electronics Engineering Center, State University of New York, Binghamton</i>	<b>IEEC Research Projects, July 2006- June 2007</b>	<a href="#">Launch Site</a>	Two current lead-free projects listed: "The Effect of Voiding and Other Microstructural Factors on the Reliability of Pb-Free and PbSn Solder Joints" and "A Comparative Study of Mechanical Testing Reliability Techniques for Pb-Free Electronics Assemblies."
<i>Joining and Welding Research Institute, Osaka University, Japan</i>	<b>Research Division of Materials Joining Mechanism</b>	<a href="#">Launch Site</a>	Lists current faculty and research projects, including those in Pb-free. The Composite Materials Processing section appears to have the most activity in Pb-free.
<i>Kansai University, Department of Materials Science and Engineering, Japan</i>	<b>Ikeda Masahiko</b>	<a href="#">Launch Site</a>	This page indicates a recent research interest in lead free solder.
<i>Key Laboratory of Advanced Functional Materials, Beijing University of Technology</i>	<b>Key Laboratory of Advanced Functional Materials</b>	<a href="#">Launch Site</a>	Detailed overview of the laboratory's structure, research goals and achievements.
<i>Korea Advanced Institute of Science and Technology (KAIST)</i>	<b>Solder Research, Computational Materials Research Science Lab</b>	<a href="#">Launch Site</a>	Summaries, with graphics, of the Lab's research into Pb-free solders, using the CALPHAD method.
<i>Korea Advanced Institute of Science and Technology (KAIST), Department of Materials Science and Engineering, Center for Electronic Packaging Materials</i>	<b>Electronic Packaging Laboratory</b>	<a href="#">Launch Site</a>	Brief overviews, with graphics, of the lab's various Pb-free research projects.



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<i>Korea Advanced Institute of Science and Technology (KAIST), Research Division, Center for Electronic Packaging Materials</i>	<b>Research on New Packaging Materials: Group I</b>	<a href="#">Launch Site</a>	Provides brief descriptions, contact names and links related to this group's Pb-free research.
<i>Korea Advanced Institute of Science and Technology (KAIST), Research Division, Center for Electronic Packaging Materials</i>	<b>Researches on Next Generation Package Processes: Group II</b>	<a href="#">Launch Site</a>	Provides brief descriptions, contact names and links related to this group's Pb-free research.
<i>Lehigh University, Department of Materials Science and Engineering, Bethlehem, PA</i>	<b>Michael R. Notis</b>	<a href="#">Launch Site</a>	The research link describes Dr. Notis' work in Pb-free solders.
<i>Lehigh University, Department of Materials Science and Engineering, Bethlehem, PA</i>	<b>Richard P. Vinci</b>	<a href="#">Launch Site</a>	The research link leads to a detailed description of Dr. Vinci's projects. Under "other interests" there are links to information and images related to his lead-free solder research.
<i>Michigan State University, Department of Chemical Engineering and Materials Science</i>	<b>James P. Lucas</b>	<a href="#">Launch Site</a>	Lists research interests in Pb-free solders and provides a bibliography of related papers.
<i>Michigan State University, Department of Chemical Engineering and Materials Science</i>	<b>Electronic Materials Research</b>	<a href="#">Launch Site</a>	Briefly describes several lead-free solder research projects, while providing links to the homepages of the primary investigators.

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<i>Microjoining Laboratory, State Key Laboratory of Advanced Welding &amp; Production Technology, Harbin Institute of Technology, China</i>	<b>Yanhong Tian</b>	<a href="#">Launch Site</a>	Detailed overview of education, teaching and research, including work in lead free solder.
<i>Nanyang Technological University, School of Materials Science &amp; Engineering, Singapore</i>	<b>Chen Zhong</b>	<a href="#">Launch Site</a>	Identifies interface reactions and reliability of lead-free solders as a research interest and provides a bibliography of related papers.
NASA	<b>NASA Electronic Parts and Packaging Program</b>	<a href="#">Launch Site</a>	Interactive listing to publications, papers and videos related to NASA's Pb free research.
<i>NIST, Metallurgy Division, Materials Science and Engineering Laboratory</i>	<b>Ursula R. Kattner</b>	<a href="#">Launch Site</a>	Provides an overview of research interests in solder alloy systems, as well as links to phase diagrams and simulations.
<i>National Central University, Department of Chemical and Materials Engineering, Taiwan</i>	<b>C. Robert Kao (Cheng-Heng Kao)</b>	<a href="#">Launch Site</a>	Provides an overview of Dr. Kao's research into lead-free solders, as well as a bibliography of related papers.
<i>National Central University, Department of Chemical and Materials Engineering, Taiwan</i>	<b>Cheng-Yi Liu</b>	<a href="#">Launch Site</a>	Briefly mentions a research interest in lead-free solders.



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<i>National Cheng Kung University, Department of Engineering Science, Taiwan</i>	<b>Lab Web Sites</b>	<a href="#">Launch Site</a>	Interactive listing of university labs, including the Electronic Packaging and Mechanics Group where lead-free research is taking place.
<i>National Cheng Kung University, Taiwan</i>	<b>Electronic Packaging Laboratory, Department of Engineering Science</b>	<a href="#">Launch Site</a>	Brief description of research.
<i>National Defense Academy, Department of Materials Science and Engineering, Japan</i>	<b>Laboratory of Metallurgy</b>	<a href="#">Launch Site</a>	Lists "lead free solder" as a current research project.
<i>Purdue University</i>	<b>Carol Handwerker</b>	<a href="#">Launch Site</a>	Provides detailed description of current research interests in Pb-free, along with a bibliography of related papers.
<i>Shanghai University, China</i>	<b>Sino-Swedish Microsystem Integration Technology Centre</b>	<a href="#">Launch Site</a>	Home page of the Shanghai operation of the Sino-Swedish Microsystem Integration Technology Center. Similar descriptions to the Swedish Center can be accessed via the "research" link.
<i>Shenyang National Laboratory for Materials Science Research, China</i>	<b>Microelectronic Interconnect Materials Research</b>	<a href="#">Launch Site</a>	Overview of research study into the improvement of lead-free solder alloy and lead-free solder alloy preparation.



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<i>Tampere University of Technology, Institute of Electronics, Finland</i>	<b>Microelectronics Packaging</b>	<a href="#">Launch Site</a>	Provides a link to an overview of the Institute's lead-free solder research.
<i>The Center for Advanced Life Cycle Engineering (CALCE) University of Maryland</i>	<b>CALCE Long-Term Pb-Free Study</b>	<a href="#">Launch Site</a>	This web site features a link to an overview of a study in progress that involves the design, manufacture, test and analysis of printed circuit board assemblies with the objective of obtaining critical information related to the long-term (5-15 years) reliability of lead-free assemblies.
<i>Tohoku University, Japan</i>	<b>Casting and Advanced Solidification Processing</b>	<a href="#">Launch Site</a>	Briefly describes the laboratory's work in "Solidification and Deformation of Lead Free Solder Alloys"
<i>TWI World Centre for Materials Joining Technology, UK</i>	<b>Soldering Technology</b>	<a href="#">Launch Site</a>	Overview of consultancy and project work as it relates to soldering, including Pb free activities.
<i>Tyndall National Institute, University College Cork, Ireland</i>	<b>Microtechnologies</b>	<a href="#">Launch Site</a>	Brief mention of lead-free research. Details of Tyndall's research project, "Lead-free Solders for Surface Mount Assembly", circa 1999 can be found here: <a href="http://www.tyndall.ie/reports/1999/scientific/scimicro.htm">http://www.tyndall.ie/reports/1999/scientific/scimicro.htm</a>
<i>University of California at Los Angeles</i>	<b>Professor King-Ning Tu</b>	<a href="#">Launch Site</a>	Describes research interests and projects in Pb-free solder metallurgy.



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<i>University of California, Irvine, Department of Environmental Health, Science and Policy</i>	<b>Oladele A. Ogunseitan</b>	<a href="#">Launch Site</a>	Vitae lists papers and projects in the area of "lead free electronics."
<i>University of Greenwich, School of Engineering, UK</i>	<b>Electronics Manufacturing Engineering Research Group (EMERG) Research Projects</b>	<a href="#">Launch Site</a>	Lists several current and recent research projects in lead-free solder.
<i>University of Illinois at Urban-Champaign</i>	<b>Jian Ku Shang</b>	<a href="#">Launch Site</a>	Bibliography of papers under "Solder Interconnect Materials" research interests indicates work in lead-free solders.
<i>University of Tokyo, School of Engineering, Japan</i>	<b>Professor Tadatomo Suga</b>	<a href="#">Launch Site</a>	Dr. Suga is the director of the Microsystem Integration and Packaging Laboratory and is an organizer of Japanese roadmap of lead-free soldering.
<i>University of Toronto</i>	<b>Centre for Microelectronics Assembly and Packaging (CMAP)</b>	<a href="#">Launch Site</a>	Access provided to information on the Centre's projects, papers and programs on Pb-free research
<i>Yokohama National University, Japan</i>	<b>Research of the Shiratori-Yu Lab</b>	<a href="#">Launch Site</a>	Description of lead free solder research interests can be found about halfway down the page, next to the blue animation.





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<i>Youngstown State University</i>	<b>Robert A. McCoy</b>	<a href="#">Launch Site</a>	Vitae lists several research projects in lead-free solder.
<i>University of California Berkeley, Department of Materials Science and Engineering</i>	<b>The Morris Group</b>	<a href="#">Launch Site</a>	The "Research" tab provides a description of the group's work in lead-free solders for microelectronics.
<i>Northwestern University, Materials Science and Engineering Department</i>	<b>Morris E. Fine</b>	<a href="#">Launch Site</a>	Online biography indicates Dr. Fine's research interests in solder technology, including authorship of a chapter in <a href="#">The Handbook of Lead-Free Solder Technology for Microelectronic Assemblies</a> .
<i>Nanyang Technological University, School of Mechanical and Aerospace Engineering, Singapore</i>	<b>John H. L. Pang, Electronics Packaging Strategic Research Programme</b>	<a href="#">Launch Site</a>	Information provided on current and future research related to lead-free solder, as well as access to relevant publications.