



Kester University



KESTER UNIVERSITY

Kester's one hundred years plus of experience in soldering technology offers the industry not only soldering products, but also training and consulting services. These courses and services are designed to bring solutions to a company's training requirements as well as finding solutions to specific soldering and assembly issues. The training courses are customizable to address a company's unique needs such as lead-free and traditional assembly courses. These tailored consulting services are reinforced by our application engineering laboratories, which ultimately bring valuable engineering experience right to your process. All attendees will be issued training certificates that satisfies ISO standard requirements.

LEAD-FREE SOLUTIONS™ COURSES

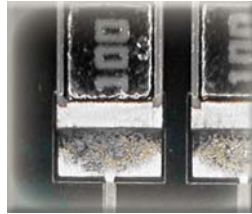
Lead-free legislation in Europe and Asia is making lead-free assembly a reality. Switching to lead-free from traditional tin-lead soldering can be a complex undertaking. Understanding the technical and commercial considerations and setting up a comprehensive implementation plan will insure that high production yields and reliability of the assembled products are achieved.

Lead-Free Assembly Technology

This course is designed for individuals seeking a complete understanding of lead-free assembly. The course examines alloy selection, flux selection, component, and board considerations as well as the process changes associated with lead-free assembly. It details the optimization of lead-free wave, SMT, and rework processes to insure reliability and preservation of the production yields.

Course Content:

- Lead-free Legislation Update
- Lead-free alloy selection
- Flux chemistry selection
- Solderability of lead-free finishes
- PCB finishes
- Component termination finishes
- Trouble shooting lead-free soldering processes
- Reliability of lead-free solder joints
- Lead-free wave assembly
- Lead-free SMT assembly
- Inspection criteria
- Rework with lead-free
- Material compatibilities



SnAgCu alloy on OSP-Cu

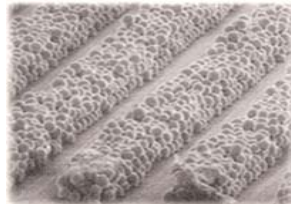
Course duration: 8 hours

Lead-Free SMT Assembly and Rework

The course is suited to those investigating or about to implement lead-free SMT assembly; it will benefit lead-free project managers, line supervisors and engineering managers. It addresses the variables and measurable elements associated with lead-free SMT assembly. It examines the equipment considerations and details the criteria that can be used to properly select the flux chemistries to achieve reliable lead-free joints. How to prevent soldering defects and reducing rework is explained in detail.

Course Content:

- Lead-free alloy selection for SMT
- Flux critical selection parameters
- Equipment requirements
- Component and board finishes
- Paste-in hole and with lead-free
- Solderability and how to enhance it
- Trouble-shooting the lead-free SMT process
- Thermal profiling for lead-free assemblies
- Compatibility issues
- BGA lead-free attach
- Pin-testability and inspection
- Reliability of SMT joints
- Preventing and reducing defects
- Reworking lead-free solder joints
- Thermo-gravimetric analysis (TGA) of fluxes and the impact on process



Course duration: 8 hours

Lead-Free Wave Soldering and Rework

The course gives a step-by-step approach to implementing a lead-free wave soldering process. It details the variables that need special attention in insuring proper hole-fill and preventing defects and repair. It addresses in-depth the function of the flux, its behavior with lead-free alloys, and the importance of optimizing flux volume, preheat, and contact times to enable reliable soldering. This course is designed for lead-free project managers, line supervisors, and engineering managers.

Course Content:

- Alloy selection for wave soldering
- Board and component compatibility
- Bottom-side SMD with lead-free
- Rework and lead-free assemblies
- Understanding the flux selection process
- Solder contact time and conveyor speed interplay
- Trouble-shooting the lead-free wave soldering process
- Chemical and physical Impact of the flux in the wave solder process
- Inspection
- Equipment requirements
- Optimizing flux performance
- Preheating and flux activation
- Reliability of lead-free through-hole
- Solderability of component and board finishes
- Flux types - no-clean, water soluble and VOC-free

Course duration: 8 hours



SMT AND WAVE SOLDERING ADVANCED TRAINING COURSES

The following courses are offered at the Des Plaines Training Center or at your manufacturing site. Designed with the intent to optimize the process from beginning to end, these courses offer the latest information on how to maximize production output yields and reduce defects.

These courses are available to line supervisors and engineering managers but can also be customized for line operators and design engineers. At the Des Plaines Training Center attendees can gain hands-on experience. The Center has wave soldering and SMT capabilities including access to complete analytical labs including X-Ray inspection and shear testing equipment.

The courses come with complete training materials and certification to accommodate your company's quality training needs.

SMT Assembly-Optimizing the Process

Course Content:

- Paste selection
- Fluxes and chemistry selection
- Thermal profiling considerations
- Trouble-shooting the printing operation
- Inert versus air atmospheres
- Component and board solderability
- Thermo-gravimetrics of the flux and impact
- Special requirements for BGA and paste-in-hole processes
- Viscosity and Rheology
- Stencil design
- Cleaning considerations
- Maintenance of the SMT line
- Soldering defects - defect analysis
- Preventing and reworking defects
- Optimizing the print process, speed, and pressure interactions

Course duration: 8 hours workshop or 16 hours with hands-on training



Wave Soldering Process Control

Course Content:

- Flux selection criteria and standards
- Titration versus density controls
- Solder defects - how to avoid them
- Preheating the flux and board assembly
- Solderability of metals and process impact
- Wave contact, conveyor speed implications
- Verification of wave settings using LevChek
- Application controls
- Thermal profiling requirements
- Bottom-side SMD assembly
- Reworking and hand soldering
- Line maintenance and SPC to insure a controlled process
- Cleaning and conformal coating

Course duration: 8 hours, includes 2 hours of hands-on experience



CONSULTING SERVICES

Kester's vast experience in soldering technology is now available to you. Our trained application engineers, chemists and research staff can assist you in resolving SMT, wave soldering, rework, cleaning issues or set up a new assembly process. With either traditional tin-lead or lead-free processes, our technical expertise collectively with our global network of relationships we have established with equipment suppliers, end-users, consultants, and universities will bring solutions to your company rapidly and completely.

A project is initiated and a complete report is supplied upon completion of the work. Non-disclosure agreements can be signed to protect your company's confidentiality.

Some of the consulting services available are:

- Lead-free SMT Implementation and Process Optimization
- Lead-free Wave Soldering Process Set-up and Control
- Lead-free Rework Training
- Defect Analysis resolution for wave soldering and SMT assembly
- Assembly line audits and optimization
- X-Ray Analysis of SMT, Through-hole, and BGA products
- Solderability Testing and interpretation
- Micro-sectioning and analysis of solder joints
- Ionic contamination



Call us toll free at 800.253.7837 for a free consultation or to reserve your training courses.

Worldwide Facilities

Kester, established in 1899, is a leading global supplier of higher performance interconnecting materials and related services for the electronic and component assembly markets. Kester is headquartered in Des Plaines, Illinois, United States, with additional manufacturing locations in Canada, Mexico, Germany, Brazil, Singapore, Taiwan, Malaysia, and Japan.

Kester products and services are used by a wide range of industries such as telecommunications, computer, automotive, military, components manufacturing, and consumer electronics. Throughout the world, Kester

products are known for their high quality and advanced technology. Kester's multiple plants assure quick delivery and protection against regional shipping delays and natural disasters. In addition, Kester has an extensive distributor network which permits easy access to sources of supply for Kester's fine products.



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