Training Modules 2018

Training Modules for M17 Ultrasonic Wire Bonders and M17LSB Laserbonders

Only highly trained employees get the best from bonding technology. Therefore we support our customers with training courses on all aspects of wire bonding and operation of the machines. With our bonding experts, operators, fitters and process managers from the semiconductor industry, automotive industry and other highly innovative electronics industries are in the best hands.

The training modules always take place in special equipped premises of F & K DELVOTEC under optimal conditions. On request, some of the modules can also be carried out on your machines on site.
BOND ACADEMY: WHAT IS YOUR BENEFIT?

Only highly trained employees get the best out of bonding technology. That is why we support our customers throughout the entire life cycle of their product with a wide range of services. From application consulting and development support to training on all aspects of wire bonding and machine operation.

- Machine Training
- Application Advice
- Development Support
- Employee Qualification in the sense of ISO 9001
- Certification by F & K DELVOTEC

SUPPORT IN STATISTICAL TEST PLANNING/ OPTIMIZING PROCESS WINDOWS

„Design of Experiments“ (DoE), is the methodically clean and statistically verified procedure for the characterization of a new process and for its optimization.

DoE is ideal for achieving a statistically secured parameter window. This method is well known, widely used and required by well-known companies. However, it is not used very often, because a DoE is considered very complex and requires expertise in statistics, the bonding process itself and a certain amount of basic software technology. The Bond Academy offers tailor-made support and thus accelerates your value creation starting with a whole range of DoE variants.

- Characterization DoE: For characterization of a multitude of parameters using Latin HyperCube-design. Recommended for the fundamental characterization of new processes and for the identification of the strongest and correlated process influences.
- Optimization DoE: An existing process is slightly modified and the most important parameters are comprehensively optimized to target values.
- Streamlined experimental design: In case of limited test and inspection time, this is the recommended variant to determine a protected process window anyway.

Even before the development of a new product, F & K DELVOTEC offers support for bondable surfaces and product design. This helps with design-for-manufacturability, shortens development time and optimizes the value-added process from the very first minute.

OUR SUPPORT TO IMPLEMENT YOUR REQUIREMENTS AND OPTIMIZE YOUR PROCESSES:

- Competent Advice
- Determination of the correct transducer frequency suitable for the application
- Rapid Prototyping
- Sample bond tests and small series production
- Validation of Product Design
- Training of your Service Technicians
- Ramp-Up-Support
TRAINING ULTRASONIC WIREBONDER

TARGET GROUP  
Bond newcomers and machine operators without further knowledge

TRAINING GOAL  
Operation of the bonder during production

SUBJECT  
This module teaches basic practical skills, which enable the user to keep the machine in operation

DURATION  
1 Day

TRAINING AGENDA

<table>
<thead>
<tr>
<th>Introduction to the Security Features of the Machine</th>
<th>Set up the machine</th>
<th>Bonding in Production</th>
<th>Camera System and PRU</th>
<th>Optionally:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Function of wire unwinding</td>
<td>In Single Wire Mode</td>
<td>Set camera Offset</td>
<td>Function of the Transport System</td>
</tr>
<tr>
<td></td>
<td>Change tool</td>
<td>In Production Mode</td>
<td>Image Recognition</td>
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<tr>
<td></td>
<td>For Heavy Wire additionally: Change wire guide, Changing and adjusting knives</td>
<td>In Rebond Mode</td>
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<td></td>
<td>Threading the wire</td>
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ENGINEER TRAINING ULTRASONIC WIREBONDER

TARGET GROUP  Fitters and process managers
TRAINING GOAL  Setting up and adapting a new product on the bonder; Optimization and problem solving in ongoing production

SUBJECT  This module teaches advanced theoretical and practical skills that enable the user to understand the machine, create an automated bonding program, and handle bonding problems and process adjustments.

DURATION  2 Days

This is an advanced module and requires the basic training. Of course it is possible to book the basic and engineer training in one package.

TRAINING AGENDA

<table>
<thead>
<tr>
<th>Set up the machine</th>
<th>Advanced bonding knowledge, Theory and practice</th>
<th>Parameter Optimization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment of the wire clamp and guidance</td>
<td>In Single Wire Mode Bonding Process, hypothesis</td>
<td>Bonding Parameters</td>
</tr>
<tr>
<td>Bonding parameters and guidance</td>
<td>Production Mode (Automatic)</td>
<td>Loopforming-Parameters</td>
</tr>
<tr>
<td>Deepening of machine components</td>
<td>Creation of a Bonding program</td>
<td>Tear-Parameters</td>
</tr>
<tr>
<td>Bondhead</td>
<td>Modify Bonding program</td>
<td></td>
</tr>
<tr>
<td>Safety Features</td>
<td>Programming the Wires</td>
<td></td>
</tr>
<tr>
<td>Machine Calibration</td>
<td>Modify Bonding program</td>
<td></td>
</tr>
<tr>
<td>Sensor Calibration, Spool</td>
<td>Programming with GUI</td>
<td></td>
</tr>
<tr>
<td>TD-Sensor</td>
<td>(Inhead Pulltester)</td>
<td></td>
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<tr>
<td>Bond Weight</td>
<td></td>
<td></td>
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<tr>
<td>Ultrasonic System</td>
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</tbody>
</table>

EXPERT TRAINING ULTRASONIC WIREBONDER

TARGET GROUP  Advanced training for fitters and process managers with Engineer Level
TRAINING GOAL  Setting up and optimizing even difficult new products on the bonder; a deeper understanding of the bonding process and details of the machine function. Analysis and elimination of even more difficult process problems.

SUBJECT  This module teaches extended theoretical and practical topics. The expert trainings can be arranged individually.

DURATION  1 Day

TRAINING OPTIONS

- Ultrasonic System
- Process Monitoring
- BPC-Screen
- CAN-Bus
- Setup Tool
- Design Rules
- Pattern Recognition Unit
- User Administration, Process Windows
- Function of the transport system
SERVICE AND MAINTENANCE TRAINING

TARGET GROUP  Service Employees
TRAINING GOAL  Ongoing preventive maintenance and simple repairs, e.g. by replacing spare parts
SUBJECT  This module teaches the function of the mechanical and electrical components of the machine. Participants will be trained in troubleshooting and simple repairs.
DURATION  3 Days

This training module can only be offered at F & K DELVOTEC headquarters.

TRAINING AGENDA

<table>
<thead>
<tr>
<th>Introduction to mechanical and electrical components</th>
<th>Ongoing maintenance and care</th>
<th>Introduction to Service Software Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Function of Wire Unwinding (Parameter in PAGE 144, Sensor Calibration)</td>
<td>• Transducer Exchange</td>
<td>• CAN-Bus (Design, Function, Measurement)</td>
</tr>
<tr>
<td>• Function of the Components on the Bond Head</td>
<td>• Bond Head Replacement</td>
<td>• Setup Tool</td>
</tr>
<tr>
<td>• Mechanical Components, XYZP-axis</td>
<td>• Calibrations: TD sensor, Bond weight, Ultrasound, Inhead Pull Tester if necessary</td>
<td>• Create Logfiles (Machine Data and UBPC-Data)</td>
</tr>
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<td>• Electronic Inserts</td>
<td>• Change Tool</td>
<td></td>
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<tr>
<td>• Main Power Supply, PCI Power Supply</td>
<td>• Replace wire guide hose</td>
<td></td>
</tr>
<tr>
<td>• Motion System</td>
<td>• Threading the Wire</td>
<td></td>
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<tr>
<td>• Function of the different Plug-in units</td>
<td>• Adjusting the Wire</td>
<td></td>
</tr>
<tr>
<td>• If available: Function and Test of the Transport System</td>
<td>• Replace wire clamp and readjust</td>
<td></td>
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</tbody>
</table>

BASIC TRAINING LASERBONDER

TARGET GROUP  Machine Operators without further knowledge
TRAINING GOAL  Operation of the bonder during production
SUBJECT  This module teaches basic theoretical and practical knowledge about the operation of the laser bonder in ongoing production.
DURATION  3 Days

TRAINING AGENDA

<table>
<thead>
<tr>
<th>Introduction to the Laserbonder and into the Laserbond Process</th>
<th>Design and function of the machine and the machine processes in detail</th>
<th>Structure and function of the software</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Laser Basics</td>
<td>• Machine Mechanics, Machine Setup</td>
<td>Creation of Bond Programs incl. practical exercises</td>
</tr>
<tr>
<td>• Laser Safety</td>
<td>• Laserbond Parameters: Adjustment manual, Programming</td>
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</tr>
</tbody>
</table>

M17 LSB
POWERFUL SYNERGIES:
„MEMBER OF STRAMA GROUP“

Strama-MPS develops special-purpose machinery, equipment and complete solutions for the production, assembly and testing of complex technical components and products. International technology groups appreciate our engineering expertise, the experience and the certainty: We lead your project to success.

AuE Kassel has acquired in recent years an excellent reputation with assembly lines for axles and chassis components in the passenger car and commercial vehicle sector. With its axle alignment systems AuE has long been the world market leader.

Over the last 40 years, F & K DELVOTEC is the worldwide innovation leader for wire and laser bonders. Renowned companies and research institutes worldwide are convinced by the quality of the technology and engineering services.