The MRSI Worldwide Advantage

Advanced MRSI technology combines with worldwide application support, dependable service and our knowledgeable sales organization to give you the MRSI advantage. Let us know about your manufacturing challenges. We provide solutions.

Please drop in

MRSI headquarters is located in North Billerica, Massachusetts, just 30 miles northwest of Boston. You’re welcome anytime.

MRSI-505 ADVANCED PACKAGING

Advanced Packaging Work Cell
Assembly • Dispense

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The MRSI-505 ADVANCED PACKAGING work cell is designed to meet the industry standard for ultra-precise, high-speed component assembly. Offering advanced vision and fully-automated operation, the system is specifically designed and configured for the advanced packaging solutions required for medical, military, automotive, computer, aerospace and communications applications.

The MRSI-505 ADVANCED PACKAGING can be configured for several component attach technologies and applications including the following:

- **Technology Configurations**
  - In-situ Eutectic Bonding
  - Integrated Eutectic Bonding in a Reflow Chamber
  - Conductive Epoxy Component Attach
  - Non-conductive Epoxy Component Attach
  - Flip Chip Bonding

- **Typical Applications**
  - Semiconductors
  - Magnetic and Optical Discs
  - Hybrid Circuits
  - Multichip Modules
  - Chip-on-Board
  - Picoscale
  - Guidance Systems
  - Drug Delivery Devices
  - A to D Converters
  - Disk Drive Controllers
  - Hearing Aids
  - A to D Converters
  - Micro Electro-Mechanical Systems
  - Defibrillators

The MRSI-505 ADVANCED PACKAGING provides the ultimate solution for electronic packaging.

**Precision, speed, and reliability**

MRSI builds the MRSI-505 ADVANCED PACKAGING to meet your specific requirements for reliable and dependable operation. The system's design is based on the award-winning, industry standard MRSI-505 platform. The major system axes use brushless DC linear servo motors with linear glass-scale encoder feedback. These encoder scales have 0.5 micron resolution for fast, clean, precise, closed loop positioning. The sensitive design employs a minimum of moving mechanical parts. A solid granite platform supports the placement head from above, so no mechanisms are cantilevered. All this makes the MRSI-505 ADVANCED PACKAGING thermally and mechanically stable with extremely fast settling times and +/- 0.0005 inch (125 microm) or better placement accuracy required for critical applications.

**Flexible automation**

The large work envelope and overhead gantry design is ideal for developing cost effective, customer configured systems. The system picks from any combination of Gel-Paks™, wafer packs, tape feeders and SurfPlates™ feeders. For picking from expanded wafer the systems utilizes a controlled force lift mechanism for picking even the thinnest die and largest aspect ratio die. Low res positioning and vendor wafer mapping assures only known good die are picked. The 700 square inch work area easily holds an unlimited variety of required inputs and outputs. For example, the MRSI-505 ADVANCED PACKAGING holds up to 75 two inch wafer packs, plus a conveyor system. The adjustable width, in-line conveyor transports boats, common carriers or lead frames. The system features an automatic thirteen-position tool bank that holds both vacuum collets (conical, perimeter, inverted pyramid, custom) and epoxy dispensing tools.

**Unmatched handling capabilities**

The MRSI-505 ADVANCED PACKAGING handles the tedious, critical tasks that are a challenge for the microelectronics industry. One example is microwave circuit manufacturing. The MRSI 505, with controlled, programmable contact force, routinely picks and places delicate Gallium Arsenide (GaAs) die with air bridges and flux. The ultra-precision placement accuracy significantly reduces in-process tuning times. This enables repeatable assembly, which simplifies downstream operations such as wire bonding and minimizes in-process microwave tuning.

A second example is the picking and placing of small devices. The system easily handles devices as small as 0.008 inch (200 microns).

The MRSI-505 ADVANCED PACKAGING has controlled programmable pick-up and placement force for placing thin, delicate devices.

**Quality software behind the award-winning hardware**

The MRSI-505 ADVANCED PACKAGING has excellent software to match its unsurpassed hardware. Key features include a simple, intuitive user interface and material traceability. The system uses barcode reading to automatically track key die and substrate information to keep a pedigree of each device. CAD downloading makes programming of new devices fast and easy. The system automatically searches for die images from alternate vendors based upon pre-taught features.

**Advanced machine vision**

The vision system includes advanced features for die orientation and substrate fiducial alignment. The system allows die to be presented in any orientation over a full 360 degrees and still identifies and picks them. This enables the alignment of orientation-critical die such as MMICs and beam-lead diodes. The vision system then aligns and places the die according to the substrate fiducials or relative to the features of previously placed die. This feature is invaluable for ensuring repeatability and in aligning optical devices.

**Unmatched process capabilities Eutectic bonding**

The MRSI-505 ADVANCED PACKAGING supports multiple eutectic processes such as Gold Silicon, Gold Tin and Gold Germanium reflow. Unique capabilities include a heated assembly station with fast closed-loop temperature ramping and customized parts hold-down for small and odd shaped parts. The system is available in in-situ eutectic bonding performed either on a hotplate, directly in a boat or in a chamber. MRSI-505 ADVANCED PACKAGING has excellent software to match its unsurpassed hardware. Key features include a simple, intuitive user interface and material traceability. The system uses barcode reading to automatically track key die and substrate information to keep a pedigree of each device. CAD downloading makes programming of new devices fast and easy. The system automatically searches for die images from alternate vendors based upon pre-taught features.

**Advanced dielectric solutions**

The MRSI-505 ADVANCED PACKAGING has a unique capability for applying flux to solder bumps prior to placement.

**Flip Chip Bonding**

The system supports both solder reflow, direct chip attach and thermal compression flip chip bonding. Using an upward-facing camera for vision alignment of flip chips, the integrated vision captures the image of die features while the die is held on a vacuum collet prior to placement. For solder reflow applications, a flux dispensing station is provided for applying flux to solder bumps prior to placement.

For flip chip bonding, the system supports both solder reflow, direct chip attach and thermal compression flip chip bonding. Using an upward-facing camera for vision alignment of flip chips, the integrated vision captures the image of die features while the die is held on a vacuum collet prior to placement.

**A real production tool backed by years of field experience**

The MRSI-505 ADVANCED PACKAGING is considered the standard of the industry. The system is ideally suited for dedicated high volume production requirements, yet flexible enough for small lot production. The MRSI-505 ADVANCED PACKAGING comes with the MRSI advantage, which means it is supported worldwide with the full MRSI infrastructure of service, support, spare parts, training programs, and documentation.

**Turnkey, integrated production lines**

An in-line ultra precision assembly system is available for the total automation of your factory. MRSI has designed true modularity into dispensing, assembly and material handling. Turnkey integrated product lines are built by integrating MRSI's process-critical dispense and assembly systems with those of other OEM's. Because MRSI systems are fully SMEMA compatible, our engineers easily integrate MRSI technology with all other systems that are necessary to complete your line and make it operate seamlessly.