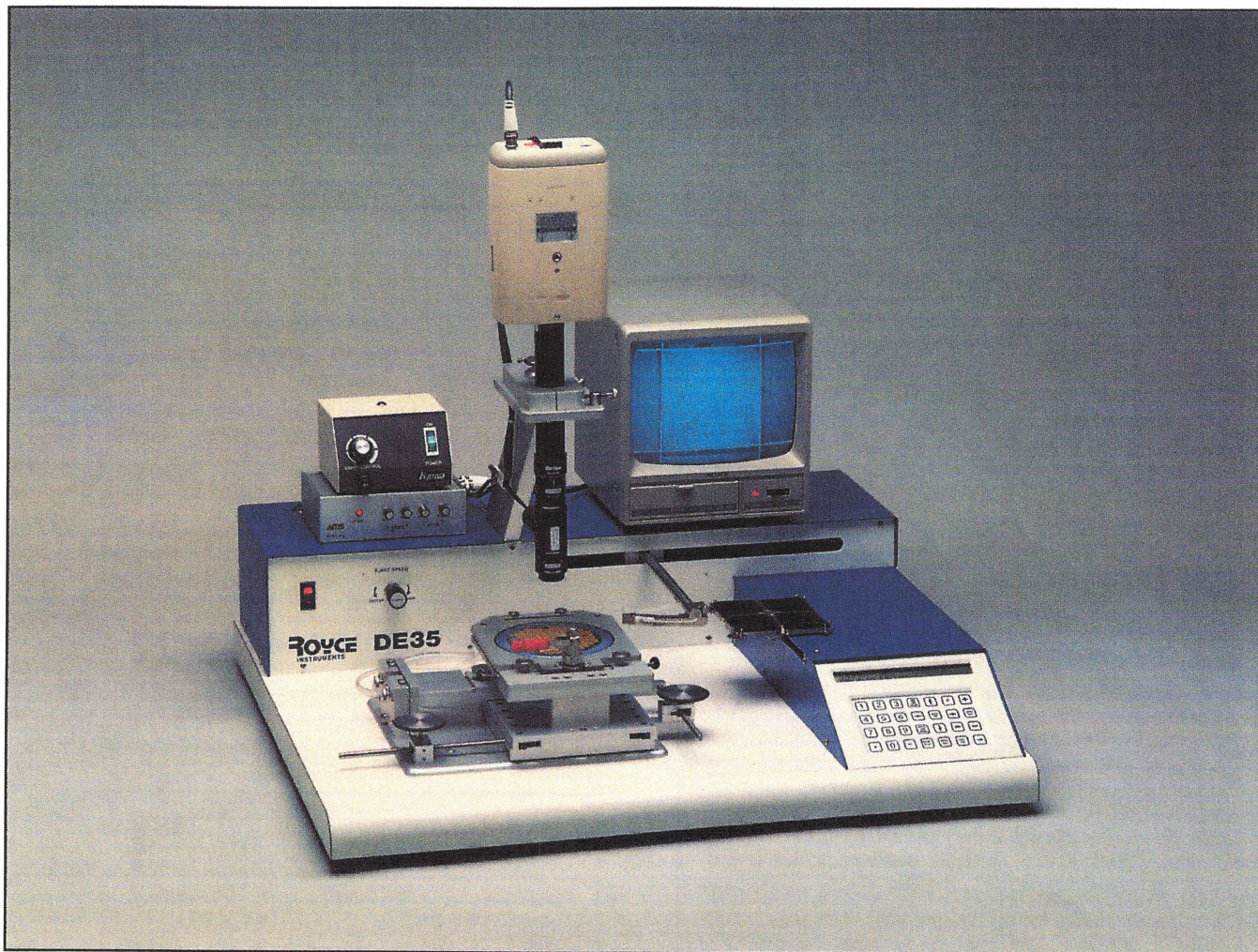


ROYCE

Instruments



DE35 DIE PICK AND PLACE SYSTEM

Delicate Die Handling at Low Cost

- Damage free picking of Gallium Arsenide die.
- Picks die from as small as 0.006 in. sq.
- Laser diode test and inspection options available.
- Handles long narrow die as much as 20:1 aspect ratio.
- Available to handle 8 in. dia. wafers.
- Picks die larger than 0.750 mil without damage.
- Non Surface Contact die pick up available.
- 1200 UPH. practical production rates.
- Can place in waffle packs, Gel-Pacs, wafers or vials.
- 30 sec. eject head changeover.
- Waffle pack sizes selected by Fluoroware part number.
- Die pick up loading reliably reproducible under 10 gms.
- Extremely simple to learn and use.
- Eject speed front panel adjustable.

GENERAL DESCRIPTION

The DE35 semi-automatic die pick and place system is an elegantly simple, low cost machine for picking die from sawn wafers mounted on adhesive film, and placing them into waffle packs or onto Gel-Pacs or film frames.

The DE35 eliminates the inefficiencies and downtime usually found in small lot production. Very simple to learn and use, the DE35 requires no hand tools for die size changeover and setup.

As well as being ideal for small lot production use, the DE35 can also solve technically difficult problems such as handling laser diodes, air bridge GaAs FETs and IC's, long narrow CCD optical arrays or other delicate structures often found in R&D and specialized production environments.

The pick up head, which is supported on zero backlash Z motion flexures and controlled by stepper motor.

Die are lifted and carried from the sawn wafer to the placement position with a precision of better than 0.002 in. The Z resolution is 0.001 in. so that pick and place force can be reproducibly controlled under 10 gms with a resolution of better than 1/2 gm. The pick up tools have industry standard shank sizes so that surface pick up tips are readily available from a number of manufacturers or direct from Royce Instruments.

For untouchable die top surface geometries, true non surface contact die pick up is also available.

Setup couldn't be easier. The output mode is first selected from the keyboard from a menu which includes 1,2 or 4 waffle pack grades, or tape array output. The output dimensions are then selected from a keyboard menu. On entering the waffle pack part number, the computer checks a 250 item list of Fluoroware catalog part numbers. If the waffle pack is in the list, the pocket dimensions will show in the display and the machine will automatically adjust to those output dimensions. If the waffle pack is not in the list, you can enter your own dimensions and have the option of permanently saving that configuration for future use. If you are using Gel-Pacs or film frame arrays, you can similarly assign your own permanent part number to a given output configuration.

Since the dimensions of anti-static waffle packs vary significantly from nominal, the DE35 can compensate for these variations with a simple calibration procedure.

All set up and option information is preserved in non-volatile memory so that, following a weekend shutdown for example, you can restart the machine without further set up.

Operation couldn't be easier. The die is first targeted by CCTV, light spot or microscope. On pressing the foot pedal, the arm picks up the die and places it automatically in the next waffle pack pocket. The next pocket for placement can also be manually selected using the keyboard arrow keys to enable completion of partially completed waffle packs. If a grading output mode is selected, the machine places the die in the next pocket of the corresponding waffle pack and advises the operator when any of the waffle packs are full.

Machine adjustment couldn't be easier. When in the keyboard selected "single step" mode, the system performs only one discrete machine operation at a time. The operation description and status is displayed for each step.

Machine adjustments are made via the keyboard and stored in non-volatile memory. To make adjustments of heights and positions in the pick and place cycle, a separate "Teach" key must be pressed. This prevents accidental adjustments from being made.

Eject heads are available covering die sizes from 0.010 in. to over 1.000 in. Eject heads are self-contained units and contain individually replaceable, pre-planarised needles. Eject head changeover takes less than 30 seconds. Custom eject heads are available.

The ejection mechanism is operated by low pressure air and the ejection speed is adjustable with a precision needle valve from 0.1 secs. to over 10 secs. The pick up head awaits die release from the film before lifting and carrying the die to the placement position.

Wafer expansion is performed in the film frame holder and may be adjusted up to 3/8 in. Film frame holders are available to suit all film frames or rings. Rotation adjustment is built into the film frame or ring holder and can accommodate up to ± 5 deg. alignment errors. The film frame is positioned by a handwheel controlled X-Y stage. Wafers up to 8 in. dia. can be used. Placement tooling is available to accommodate waffle packs, Gel-Pacs, film frames, vials and custom die trays.

OPTIONS AND ACCESSORIES

Please refer to price list for detailed breakdown of all currently available options.

OPTICAL SYSTEM

For simple die targeting, a light spot or black and white or color CCTV system are available.

If the application requires inspection, optics are available from simple stereo microscopes up to 500 X "2nd optical" metallurgical quality microscopes.

DIE PRESENTATION

For die presentation from adhesive tape, 4 in., 6 in. and 8 in. wafer die ejection stages are available.

The wide variety of standard eject heads cover die sizes from 0.006 to over 0.750 in. square.

For picking die structures such as CCD or air bridge GaAs VHSIC IC's, a unique Non Surface contact die pickup system is offered.

Various fixtures may be used for die kitting applications including a "lazy susan" style turntable chuck to rapidly orient die by rotating them about the optical centerline of the video system.

DIE PLACEMENT

The standard die placement fixture accommodates 4 waffle packs, 2 in. square. Output tooling options include film frame fixtures for die array assembly, a 4 in. waffle pack fixture and custom die tray fixtures.

SPECIFICATIONS

PICK AND PLACE PRECISION	• 0.002 in.
SMALLEST DIE SIZE	• 0.006 in.
LARGEST DIE SIZE	• Over 0.750 sq.
LARGEST WAFER	• 8 in. dia.
DIE PICK UP LOADING	• Adjustable to under 10 gms.
MACHINE THROUGHPUT	• 700 to 1200 UPH, dependent on eject speed, wafer yield etc.
MACHINE DIMENSIONS	• 30 in. wide, 26 in. deep, 30 in. high with CCTV, weight approx 70 lbs.
VACUUM SUPPLIES	• 20 in. Hg minimum, 25 ins. Hg preferred.

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