Since its introduction, the Ultraprint 2000 HiE has become the industry choice for high performance, reliable automated stencil printing. A key factor in its immediate worldwide acceptance has been its unique combination of high-end features and flexible options at an ideal price. The Ultraprint 2000 HiE offers many advantages.

A choice of three advanced print heads assure process flexibility. Y-snugger board clamping handles a full range of board types, while a patented alignment system provides unparalleled accuracy and repeatability. In addition, a user-friendly interface makes the printer easy to set up and operate for increased uptime and productivity.

At Speedline, we understand the challenges of today's manufacturing environment. And we're ready with the products and technology to tackle those challenges. The Ultraprint 200 HiE reflects our continued commitment to helping our customers make world-class electronics products: faster, better and with lower costs.

Ultraprint 2000 HiE Features

MODULAR DESIGN ENSURES SUPERIOR ADAPTABILITY

- Choice of three advanced print heads for process flexibility.
- Configurable with a full complement of automated options for easy integration.
- Less than 12 second cycle times (excludes print stroke).
- Y-Snugger board clamping provides ability to handle full range of board types.
- Low Contrast feature allows inspection of optically challenging substrates (ceramics, flex circuits).

HIGH ACCURACY FOR SUPERIOR PRINT RESULTS

- Patented alignment system provides unparalleled accuracy and repeatability.
- Balanced Control Print head provides true closed-loop print pressure control for repeatable, precise printing.
- Tactile sensor accurately measures and sets squeegee height and snap-off distance for each board type.
- 2D and 3D Post-Print Verification tools provide real-time process control and intelligent adaptivity.

EASY-TO-USE PRINTER CONTROLS FOR EFFICIENT OPERATION

- Microsoft Windows NT™ software minimizes setup time and user training.
- Programmable features are easily accessed through just three menu screens.
- On-board SPC data collection capability provides real-time process control.
- Multiple language capability for worldwide operation.

UPGRADES ENSURE LONG-TERM PRODUCTIVITY

- Retrofittable hardware options guarantee continuous technology advancement over time.
- Software upgrades and site licenses provide cost-effective and easy-to-install enhancements.
- Speed Enhancement and Productivity upgrades boost performance of non-HiE machines to near-HiE levels

A full complement of innovative features and flexible options to meet your high precision printing needs

Standard Features

Vision "On-The-Move" Alignment

Automatic Board-to-Stencil Alignment

This feature uses advanced vision algorithms to quickly process fiducials 'On-The-Move' for efficient image capture. The patented look-up/look-down illumination and optics technology provide advanced closed-loop feedback.

Custom motion control optimizes camera transit to ensure the fastest and most accurate board-to-stencil alignment in the industry.

Microsoft Windows NT™
The User Interface allows tailoring of machine parameters to meet critical process requirements. Pull-down menus and live video images provide fast and easy setup. Unique access control features ensure product profile integrity. Software upgrades and site licenses are also available for machines currently installed at customer locations.

Self-Leveling Print Head

This allows squeegee pressure, print speed and downstop to be independently adjusted for both front and rear squeegee blades for optimal print quality. Pressure and downstop are driven by a precision stepper motor and adjusted by independent computer-controlled systems.

Self-Leveling Print Head

- Integrated tactile sensor automatically measures and sets squeegee height and snap-off distance.
- Automatic downstop allows controlled compliance to the board topography and eliminates stencil 'snap-back.'

Standard Options

The Rheometric Pump Print Head

Print head is a quantum leap in the printing process, providing precise control of the material application. Because the paste is no longer exposed to air, consistent paste dynamics are applied to the product with each print.

Rheometric Pump Print Head

Paste savings of 70 percent can be achieved using the Rheometric Pump over standard squeegee blades. Multiple head sizes allow the Rheometric Pump to adapt to different board sizes.

Automatic Paste Dispensing System

This system uses industry-standard cartridges to release programmable amounts of solder paste, adhesive or encapsulants in a clean bead across the stencil. The system initiates dispensing at operator defined intervals. A disposable nozzle simplifies cleanup and minimizes operator exposure to materials.

Balanced Control Print Head

The Balanced Control Print head features frictionless electro pneumatic controls to ensure the most accurate and repeatable pressure control for precise paste deposition. Print speed, blade attack angle, squeegee downstop, and left and right print pressures all can be independently adjusted for both front and rear squeegee blades. Actual print pressures are monitored five times per second during the print stroke and adjusted real-time using closed-loop feedback control. Automatic downstop allows controlled compliance to board topography and eliminates stencil coining and 'snap-back.'

Temperature Control System

The Temperature Control System monitors, maintains and controls temperature within the print chamber to ensure consistent, repeatable print results. Temperature is maintained at a tolerance of +/- 2 degrees F. The system incorporates a 10,000 BTU air conditioner and a 1,400-watt heater. The unit also measures and records humidity conditions within the print chamber. On-line SPC alerts the operator to temperature and humidity fluctuations.

Y-Snugger Tooling System

The Y-Snugger Tooling System provides a physical board holding system for securing boards without the use of vacuum. Side-snugger bars adjust automatically, allowing fast changeover with no manual intervention. Z-Grip fingers eliminate board warpage and retract to allow for true contact printing.

Y-Snugger Tooling provides superior board support

Under-Stencil Cleaning System

The Under-Stencil Cleaning System provides automatic, unassisted cleaning of the bottom side of the stencil. A lint-free paper wiping system removes material bleed-out. A powerful, independently programmable Venturi vacuum system (optional) removes stubborn solder paste from fine pitch stencil apertures, eliminating 'opens' on the final assembly.

Stencil UltraWiper minimizes defects

The paper-over-plenum design reduces maintenance by filtering out particles, while a constant-speed paper feeder minimizes paper consumption.

Integrated Post-Print Analysis System

This option uses 2D and 3D Verification features to provide quantitative performance of actual paste coverage and height immediately following the print cycle. Using the printer's vision system, state-of-the-art software minimizes verification times by determining the shortest path between devices, providing instant, efficient confirmation of print quality. Adaptive control is achieved via built-in SPC data collection software. The system continuously monitors and analyzes current process performance and can instantly self-adjust print parameters for optimum performance.

- 2D Paste Coverage - The percentage of pad coverage is quickly calculated and compared to user-defined limits, highlighting pads with insufficient coverage. Enhanced BGA capability provides verification of pads down to 0.010" diameter at 0.020" pitch. In-line and QFP devices down to 0.012" pitch are supported. The new Background Mask feature minimizes variability caused by vias and traces on the board. The Adaptive Control option triggers a wipe-on-reject cycle for optimum process control.
- Custom BGA Template - Enables the user to teach and inspect a device with any pad array configuration. Files for device sizes up to 50 x 50 (2500 pads) can be created and stored.
- Low Contrast 2D - The Background Mask feature and advanced vision technology allow measurement of paste coverage on pads that are indistinguishable from the substrate and cannot be seen by standard vision systems. The adjustable mask 'blacks out' the area surrounding the pad to provide the resolution necessary to obtain accurate readings for any device type. Coupled with the optional low contrast alignment feature, Low Contrast 2D enables paste coverage verification on optically challenging substrates such as ceramics or flex circuits.

3D Paste Height

Analyzes solder paste height and profile via a laser scan of the printed pad at rates of up to 14 pads per second. The Adaptive Control option adjusts print pressures based on trend data generated by the SPC software.

3D Paste Height
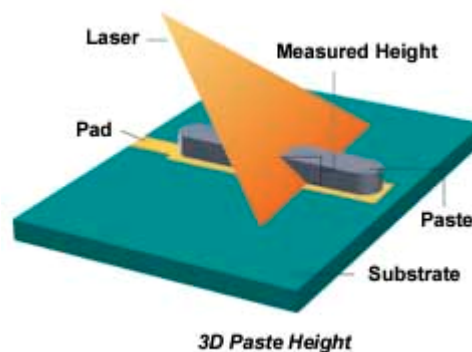
ULTRAPRINT 2000 HiE	
BOARD HANDLING	
Minimum/Maximum size	2"x 2" (50.0mm x 50.0mm) to 20" x 16" (508mm x 406mm) (16" or greater board lengths require dedicated workholder)
Thickness range	0.015" - 0.500"
Underside component clearance	0.50" (1.0" optional)
Machine interface	Programmable up to 60"/sec
Transport speed	(1524mm/sec)
Transport height from floor	Adjustable 34.5" - 41" (876mm x 1041mm)
Method of support in print/vision cycle	Magnetic pins, optional dedicated workholders
Method of board hold-down	Underside vacuum, Y-axis snuggers and Z-axis clamps
Conveyor configuration	Factory-configurable front or rear rail justified
Transport track feed direction	User definable
PRINT PARAMETERS	
Print area	18" x 16" (457mm x 406mm) (x,y)
Snap-Off	-0.050" to +0.1" (-1.3mm to 2.5mm)
Squeegee pressure (Balanced Controled)	1 - 60 lb (0.4 kg - 27 kg)
Squeegee pressure (Self-Level Head)	1 - 50 lb (0.4 kg - 22.5 kg)
Squeegee speed	0.25 - 12=/sec (6.35 - 305mm/sec)
VISION	
Fiducial method	2 to 5 models standard fiducials or pads
Fiducial type	All conventional fiducials accepted
Camera system	MPM unique high speed linear drive system with patented optics
PERFORMANCE	
Alignment repeatability	+/-0.001" (0.025mm) at 6 Sigma (Cp of greater than or equal to 2.0) verified with glass plate capability test
Cycle time	< 11 seconds (excluding print stroke)