

The innovative
dispensing system
that increases
throughput and yield
via significant gains in
speed, accuracy,
and flexibility.



Camalot

XyflexPro^{®+} Dispensing System

The industry's most flexible dispensing platform

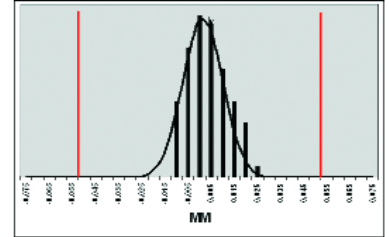
Camalot

XyflexPro⁺

Traditional dispensing platform specifications usually indicate only X-Y repeatability and/or dot placement accuracy. While valid, this data neglects important deviations that can be associated with positional error on a given machine. Total System Accuracy is the only means to determine this.

Real-World Measurements of Increased Accuracy and Speed

Going beyond current standards, Speedline has developed a more comprehensive, accurate gauge of a dispensing system's positional capability. With Camalot's XyflexPro+ platform, a critical new specification was introduced: Total System Accuracy (TSA). Representative of real-world production, TSA measures material placement accuracy relative to a target **at full system speed**.



TSA is a compilation of the following factors:

- XY positioning accuracy
- Camera calibration/Vision resolution
- Camera to needle/dispense nozzle offset calculation

XY Placement Accuracy	+/- 38 microns @ 3 sigma
XY Repeatability	+/- 10 microns @ 3 sigma
Total System Accuracy	+/- 50 microns @ 3 sigma

PUMP HIGHLIGHTS

Dot DU

- Ideally suited for adhesives, epoxies and solder paste
- Uses footed or unfooted needles
- Precise material delivery
- Minimal maintenance



Line DU

- Ideally suited for underfill and encapsulants
- Uses patented no-drip design
- Carbide parts as standard
- High flow rates



- Ideally suited for lower viscosity material <75000 cps
- Patented continuous flow piston design means zero recharge time
- Carbide pump components resist wear from filed materials
- 10cc to 6oz. cartridges direct mount to the pump
- Positive displacement design ensures volume output remains constant as material viscosity changes

A Heritage of Innovation

With over 45 patents issued to date, we're committed to inventing improvements that benefit our customers. These patents include:

Patent No.	Title
6,514,569	Variable Volume Positive Displacement Dispensing System & Method — MPP
6,541,063	Calibration of Dispensing System — Patented Pattern Weigh Routine
6,739,483	Liquid Dispensing System with Improved Sealing Auger Screw — Positive Shutoff
6,775,879	Needle Cleaner
6,814,810	Method & Apparatus for Controlling a Dispensing System — Weight Scale



SmartStream™

- New, non-contact dispense pump is well-suited for underfill applications
- Patent pending design uses a positive displacement technique to create a "Stream" of material
- Closed-loop servo drive ensures fast, repeatable performance
- Innovative design eliminates mechanical ball-to-seat contact, thus reducing wear on parts
- Narrow stream width for access into densely packed areas

	Dot DU	Line DU	MPP	SmartStream
FEATURES	Non Contact Stream			
				x
		x	x	
				x
		*x	x	x
			x	
PROCESS	x			
	x			
	x			
	x	x	x	x
		x	x	x

* Optional

Accuracy + Speed + Flexibility + Configurability

The XyflexPro⁺ platform represents a synergy of four elements key to a superior dispensing system: accuracy, speed, flexibility, and configurability. Its many product features each deliver multiple user benefits.

The system's unique design architecture allows XyflexPro⁺ to be retrofitted in the field with any option, anytime. This offers the user optimum adaptability for future applications – a must for a rapidly changing environment. Coupled to this is an unmatched ability to change back and forth from SMT to semiconductor applications with minimum downtime.

Dual-Mode Weight Scale

Patented closed-loop weighing process allows measurement of both global and actual dispense patterns for maximum accuracy. Changes in material viscosity are controlled with automatic compensation.

Gantry Structure

Rigid composite design utilizes linear motors and encoders, giving calibration-free operation in the most demanding production environments.

Part Handling

Configurable transport system allows up to three conveyor zones that can support contact or non-contact heat chucks and SMT edge clamps. Design enables quick changeover between configurations.

The XyflexPro⁺ system incorporates patented dispensing technologies in its Multi-Piston Pump, positive shut-off dispense units, and SmartStream pump. All dispense pumps incorporate a quick-release mechanism, allowing fast and easy changeovers.

Combining these advances with Speedline's proprietary Camalot Benchmark[®] software delivers superior ease of use and the ability to precisely control dispense volumes, resulting in a system with unparalleled performance.

Advanced Pump Technology

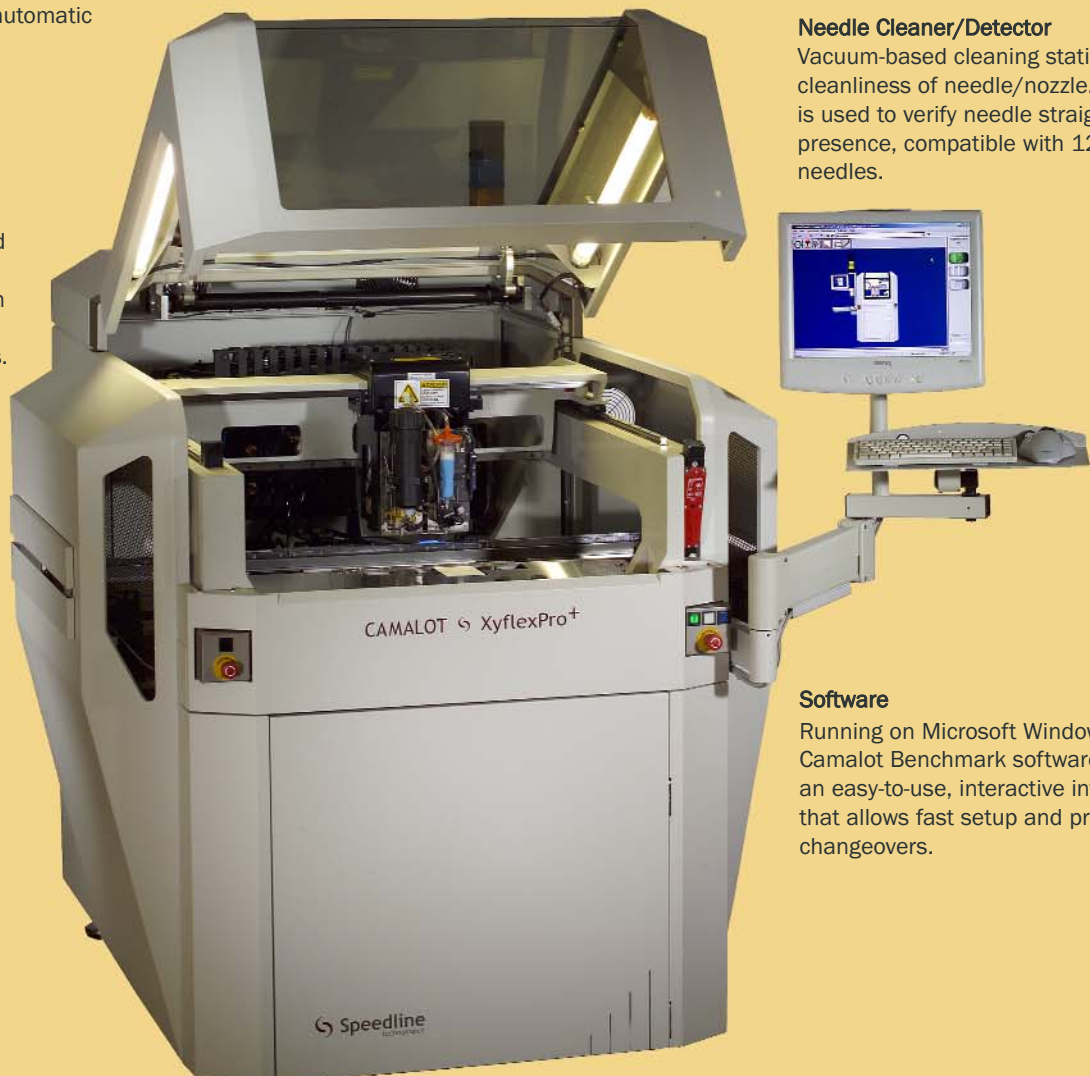
A wide range of auger, multi-piston and non contact pumps are offered to meet an array of users' manufacturing requirements.

Needle Cleaner/Detector

Vacuum-based cleaning station ensures cleanliness of needle/nozzle. A detector is used to verify needle straightness and presence, compatible with 12–32 gage needles.

Software

Running on Microsoft Windows[®] XP, Camalot Benchmark software furnishes an easy-to-use, interactive interface that allows fast setup and product changeovers.



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CAMALOT XyflexPro⁺ SPECIFICATIONS

SMT Applications	SMA, solder paste, conductive adhesives
Semiconductor/Packaging	Underfill, encapsulant, thermal grease, lid seal, die attach
XY AXIS	
XY Placement Accuracy*	+/- 38 microns (0.0015") @ 3 sigma
Repeatability*	+/- 10 microns @ 3 sigma
Speed	750 mm/s (29.5"/sec)
Acceleration	1.5 g
Encoder Resolution	1 micron
Gantry Drive System	Linear motor/encoders
Total System Accuracy (TSA)* CpK > 1.0	+/- 50 microns (0.002") @ 3 sigma
Z AXIS	
Z Axis Accuracy*	+/- 12.7 microns (0.0005") @ 3 sigma
Repeatability*	+/- 5 microns @ 3 sigma
Speed	Up to 220 mm/s (8.7"/sec)
Acceleration	Up to 3.7 g
Encoder Resolution	1.4 micron
Z Axis Type	Closed-loop dc servo, ballscrew drive
Z Sense Type	Mechanical LVDT or CCD laser
DOT PLACEMENT PERFORMANCE	
3.00 mm Pitch**	45,000 dph
1.27 mm Pitch**	50,000 dph
IPC 9850 Test PCB**	35,000 dph
TRAVEL	
Max Dispense Area (XY)***	Up to 559 mm x 559 mm (22" x 22")
Z-Axis Travel	29 mm (1.14")
BOARD HANDLING	
Conveyor Type	Flat belt with auto-width adjust
Minimum Conveyor Width	25.4 mm (1.0")
Above-Board Clearance	25.4 mm (1.0")
Underboard Clearance	30.5 mm (1.2")
Transport Height	790 mm to 965 mm (32.1" to 38")
Protocol	SMEMA
Conveyor Options SMT	SMT edge clamps with vacuum support,
Conveyor Lift Chucks	Up to three 13" x 10" chucks
Lift Chuck Options	Heated contact w/ vacuum or non-contact (convection)
Chuck Temperature Range	Ambient to 130° C

DISPENSE METHOD	
Pump Temperature Range	Ambient to 50° C
Pump Control	Closed-loop dc servo axis
SmartStream	Non-contact, positive displacement Streaming pump for Underfill, low level sensor
Dispense Unit (DU)	Rotary positive displacement, dot DU, heated/unheated Line DU with positive shut-off, low level sensor
Multi-Piston Pump (Heated)	Standard or low-volume designs, low level sensor

STANDARD FEATURES	
Auto-Width Conveyor	XYZ calibration station
Pre-dispense Station	Purge station
Flip Chip Calculator	Auto-vision alignment
Vision System	Split beam on-axis illumination – red, or blue light
Computer	Rack-mount industrial-grade computer
Operating System	Microsoft Windows XP
Program Storage	Local hard drive, CD-RW, Ethernet and USB ports
Program Method	Teach camera, off-line programming, or text file download
Pipeline conveyor	Parallel product transfer

FACILITIES	
Power Requirements	200 to 250 Vac 50/60 Hz 20A
Air Supply Requirements	10 cfm (4.7 l/sec) at >80 psi (5.5 bar) filtered at 5 microns
Machine Footprint (W x D x H)	1270 mm x 1440 mm x 1529 mm (50" x 56.7" x 60.2")
Machine Weight	1100 kg (2425 lb)
Crated Weight	1221 kg (2690 lb)
Industry Standards	CE, SMEMA, SEMI S2 & S8

OPTIONS	
Dual Mode Weight Scale	Die edge detection algorithms
Needle Cleaner	Needle Detector
Secondary Z Axis	

*At full rated speed
** 0.5 mm dot diameter, 2.5 mm needle lift
*** Consult factory for specifics.

Electronic data sheet available on request.

ABOUT SPEEDLINE TECHNOLOGIES

Speedline Technologies is the global leader in process knowledge and expertise for the PCB assembly and semiconductor industries. Based in Franklin, Massachusetts, U.S.A., the company markets five best-in-class brands – Accel microelectronics cleaning; Camalot dispensing systems; Electrovert wave soldering, reflow soldering, and cleaning equipment; MPM stencil and screen printing systems; and Protect global services, support, and training solutions. For more information, visit us at www.speedlinetech.com.

Speedline Technologies maintains an ongoing program of product improvement that may affect design and/or price. We reserve the right to make these changes without prior notice or liability.