A Simple Precise Computer controlled Print Head and Stencil Wipe Capability
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Precision printing is at the heart of the SMT production process and can be a major source of defects if you don’t have your printing process under control with a printer that has the critical technologies and capabilities to keep that process under control. In today’s printer market there are endless features and options that can be purchased with a printer. However, when it comes down to it there are a just a few critical capabilities that a printer must have that provide real process benefit and thus are “Useful Technology”. In the end it can really be boiled down to four key issues. First, how reliable, flexible, and easy to interface with is your printer allowing for maximum up time and utilization? Second, how repeatable is your printer? Do you have to pay extra to get a machine with the industry accepted standard repeatability of +/- 0.0005”? Third, does your printer provide closed loop squeegee pressure control, effective stencil cleaning, and capable post print inspection to enable your process to continue running with optimum throughput? Fourth, how capable is the machine’s vision system? Do you have to pay extra to get a vision system that can “see” multiple substrate materials and accurately perform fiducial acquisition?

EKRA has designed and developed technologies that answer these four issues from the ground up with simplicity and reliability in mind. As a result, they are robust, reliable, easy to maintain and easy to use, while directly contributing to outstanding accuracy and board-to-board consistency throughout the printing process.

Many components affect printing yield, however, squeegee pressure and speed control is where, “the rubber meets the road.” When evaluating printing equipment one question that needs an answer should be; are closed loop controls standard or do you have to pay extra to get them and does the printer have sufficient control to ensure consistent print speed?

Ekra has equipped all their automatic printers with a standard dual squeegee print head with pneumatic pressure control. This system provides a direct pressure control that does not rely on indirect and imprecise methods like servo feedback, springs pressure that changes over time, or other mechanical methods. The fully pneumatic system is simple and reliable and unlike motor/spring-based systems, the Ekra system requires no routine maintenance or calibration, ensuring that consistent printing results are produced throughout the life of the printer. The system also includes a closed loop pressure feedback system that monitors squeegee pressure constantly throughout the entire print stroke enabling the system to be impervious to substrate thickness changes or other Z axis differences. This combined with stepper motor squeegee drive control ensures that consistent results are achieved print after print.
The same design principles are evident in the IROC's Vacuum Under Stencil Wiping System. IROCS is short for Integrated Rapidly Oscillating Cleaning System. The system is designed for efficient and effective cleaning as well as outstanding ease of use. First, effective under stencil cleaning is facilitated by an integrated high volume vacuum blower that takes up no additional floor space and is combined with motion control of the vacuum plenum that allows the plenum to oscillate while traversing the stencil. The oscillating wiping system also utilizes a constant, linear paper feed, which further enhances board-to-board consistency, greatly reduces waste and further speeds the production process. Solvent can be applied to the wiping paper via a gravity fed precision dispensing system that not only eliminates the need for a pump that needs to be primed and programmed but only dispenses solvent to the length of the substrate. This means less waste, less cleaning, faster and more economical operations.
Second, the overall open design of the printer allows for easy access to the wiper and the simple and reliable paper over plenum system of the EKRA system, with no tools being required to change wiping paper. This useful design provides the fastest paper changeover time of any printer on the market.

![Figure 3 EKRA IROCS Vacuum Under Stencil Wipe](image)

Third, the EKRA user interface provides total programming flexibility. The operator sets up all cleaning programs –dry, wet, frequency and vacuum modes—by simply defining parameters from a selection list in a straightforward, easy-to-understand user interface.
The application of “Useful Technologies” to EKRA’s print head and stencil wiping systems are more examples of fundamental design principles at work. Innovation is coupled with “engineered simplicity” to provide effective solutions to the real-world problems of electronics manufacturers.

EKRA America provides screen printing solutions for the SMT, Hybrid, Semiconductor Packaging, and Solar industries in the Americas. EKRA focuses on useful technology development that provides real benefit to customer processes and delivers products that are characterized by their efficiency, ease-of-use, and reliability.