

# H450 AUTOMATIC STENCIL PRINTER



## Features:

---

- Flexible Auto Clamp system.
- Very stable machined cast structure.
- Auto conveyor width adjustment.
- Adjustable width/thickness for stencil frames.
- User friendly , Windows 7 OS, intuitive operation.
- Stencil position memory function for easy and quick change over.
- Auto stencil cleaning(Dry/Wet/Vacuum).
- Automatic 2D paste inspection.

## Description:

---

The solder paste application process is the first and a fundamental process in the surface mount technology, (SMT) this step cause most of the failure in an SMT line.

An accurate printer must offer or take in consideration the following point: vision system with fiducious camera, cleanness of the stencil, Precision mechanical system, Clean & Clear software, and an stable electrical system.

This fully automatic screen printer H450 with automatic vision recognition function using high-precision Servo drive system to achieve fast and accurate alignment, that can reach  $\pm 0.01\text{mm}$  of precision.

It build in independent cleaning system, the cycle time is less than 7seconds, ensuring high printing quality of the solder paste and efficient final product.

It also can print 0.3mm ultra fine pitch pad perfectly.

This machine controlled by computer, with Windows 7 OS user interface. The software Is designed to keeps stability and repeatability of printing quality, and many software functions, the user can set up the printing height, squeegee pressure, printing stroke, speed, and stencil automatic cleaning cycle.

## Key points to get a good printing quality:

---

The screen printing process is one of the key processes in surface mount technology that controls manufacturing yield, and it's also the station caused most of the failure in the SMT line. So to choose a right printer, we need to be careful about below points:

- Vision system: vision system with fiducious camera will determine whether the stencil & PCB aligned preciously, with small tolerance it will be desaster for final printing result.
- Stencil cleaning: without a nice cleaning system to keep stencil in sharp, the stable printing performance is unexpected.
- Precision mechanical system: It's the foundation of a stable machine.
- Clean & Clear software.
- Stable electrical system.

## Description:

---

Fully-automatic screen printer H450 with automatic recognition function of machine vision, using high-precision Servo drive system to achieve fast and accuracy alignment .The precision can reach +/- 0.01mm.It build in independent cleaning system, the cycle time less than7s, ensure the high printing quality of solder paste and ultimate product efficiency. It also can print 0.3mm ultra fine pitch pad perfectly .This machine controlled by computer ,with Windows 7 OS user interface and abundant software functions, it can set printing height, squeegee pressure, printing stroke, speed, and stencil automatic cleaning cycle etc. by software .It designed to keep the stability of printing quality, and greatly facilitate to users.

## Precision Mechanical System:

---

### Machining

Precise instrument, marble checking platform and machining to ensure high printing precision.

### Top Clamping

Top clamping system can ensure PCB flatness before printing, 2 piece tableting press the edge of the PCB ,twist and warpage would be eliminated.



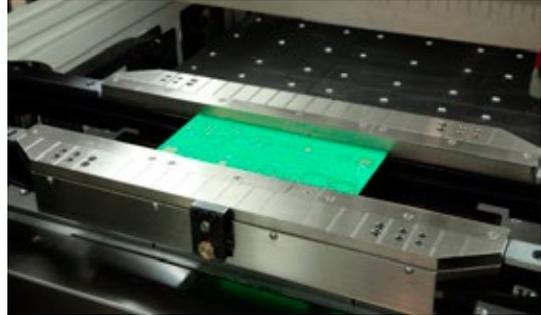
## Vacuum Clamping

Vacuum clamping is standard configuration of H450, thin and flex PCB can be clamped by vacuum to ensure the quality of printing . During production, PCB will be supported by magnetic tooling pins and vacuum module, this system can hold the PCB to keep it evenly, this function is useful for thin, twist and flex PCB.

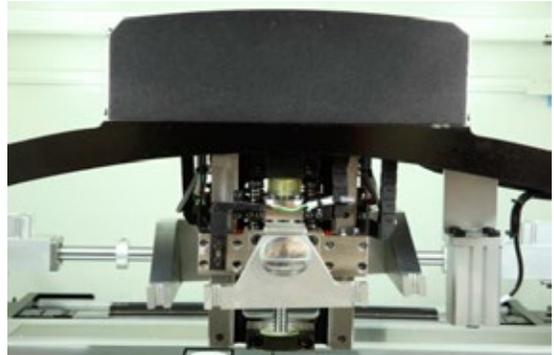


## Programmable print head

It is designed to meet the need of different pressure at the front and rear squeegee and the requirement of squeegee's leveling stability, to prevent solder paste leakage and squeegee blade with certain flexibility clamping.



Squeegee pressure can be independently programmed. This provides a stable leveling of the squeegees for precise solder paste transfer.



## 3 stage conveyor (option)

The cycle time shortened by 1 second than 1 stage.

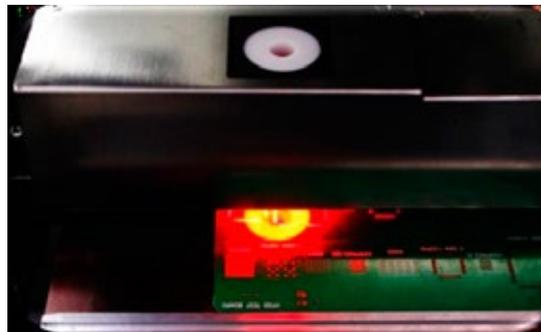
## Stable Electrical System

All electrical parts with labels, customer can find out the problem depends on error message of PC and electrical drawing soon. H450 can detect the fault by red indicating light from I/O cards, bright is normal condition, dark is abnormal. Integrated circuit and upgraded movement control card to make operation and maintenance more convenient H450 can modify printing parameter during production process .

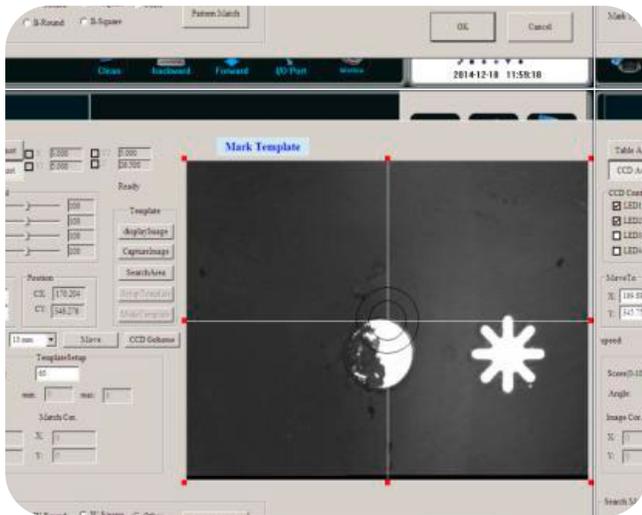


## Vision System

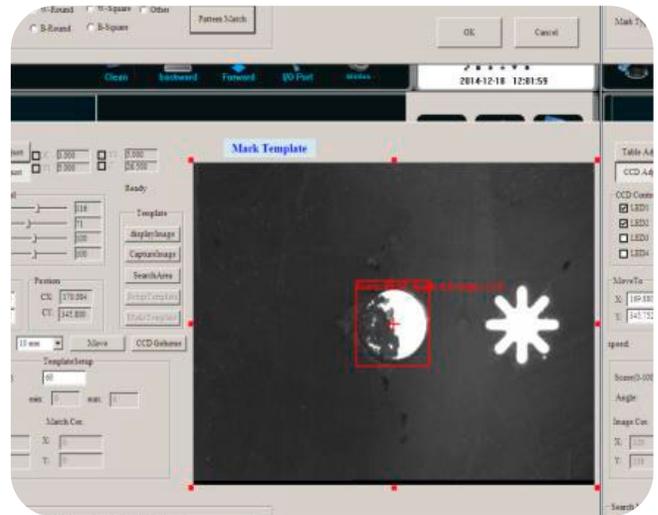
Uniform ring light and high brightness coaxial light ,equipped with ultra adjustable brightness control, makes all types of fiducial mark well recognizable (including rugged fiducial mark) and is applicable for all type of PCB and surface treatment. CCD can read incomplete or defective fiducial mark.



Challenge evaluation: Use black pen to cover fiducial mark over 40% ,and see whether CCD can read the fiducial mark ?



Find Fiducial Mark



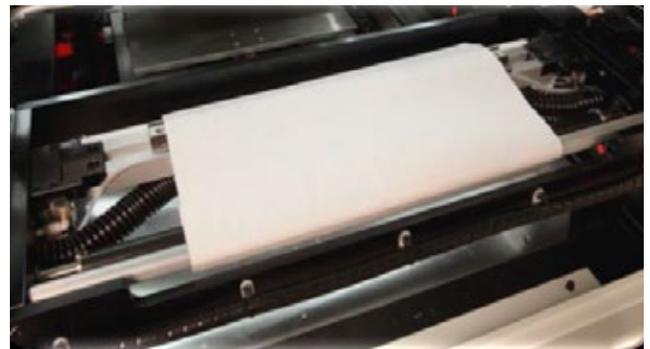
Matched and Acceptable

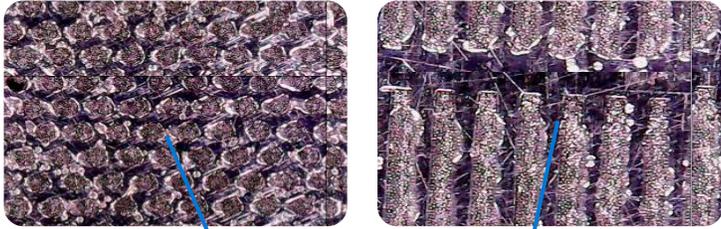
*Result: Perfect!  
Softwave can read it without any problem.*



## Stencil Cleaning System:

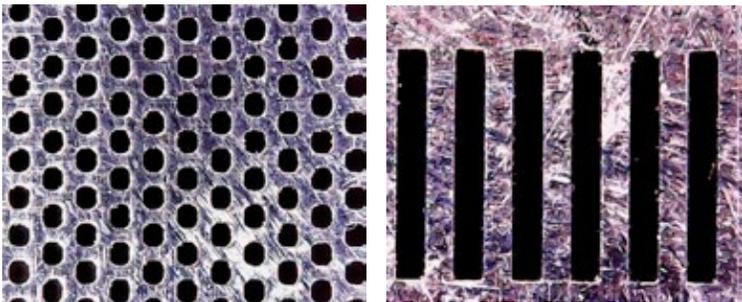
3 types of under stencil cleaning: dry, wet and vacuum. These 3 modes can be individually selected or combined for using. System allows manual cleaning within its operation menu which shortens cleaning time and improves production efficiency.





## Before Cleaning

Blocked the opening of stencil by solder paste and choose 2 areas (IC and BGA) to check cleaning result.



## Cleaning Result

Conclusion: blocked holes and IC can be cleaned completely. Customer could set up cleaning module (wet, dry and vacuum modes) depends on difficulty of stencil to improve productivity and ensure cleaning quality

## Software System :

Windows XP user interface and abundant software functions, it can set printing height, squeegee pressure, printing stroke, speed, and stencil automatic cleaning cycle etc. easy to operate, you can master it within 15 minutes.



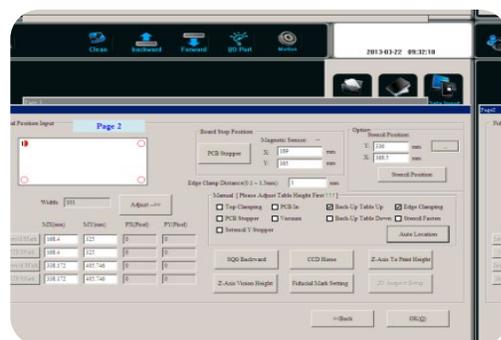
## Programming Software

Only 2 pages for programming, easy to operate and changeover

Page 1: input PCB's dimension, transportation direction and capture mode

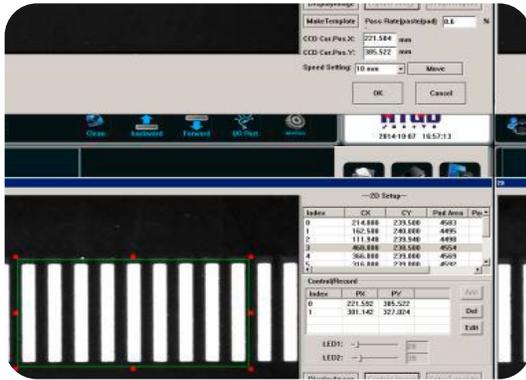
Page 2: fiducial mark positioning

Including Operation Journal/ Breakdown Record/ Breakdown Diagnosis/ Error Analysis/ Light Alarm



# Inspection Software: 2D inspection

2D inspection system immediately detects solder paste deposition defects, such as deviation, lack solder paste, miss solder paste, misalignment, solder bridge, etc to ensure print quality.

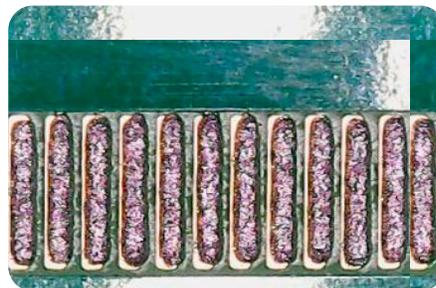
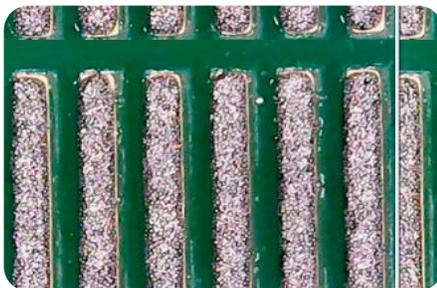
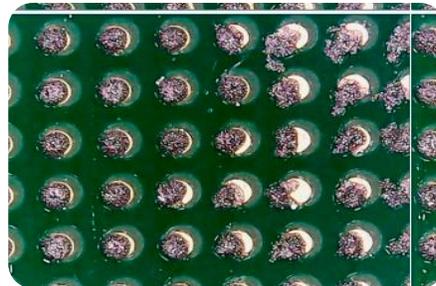


# Printing Result Comparison

500X Microscope Inspection

H450

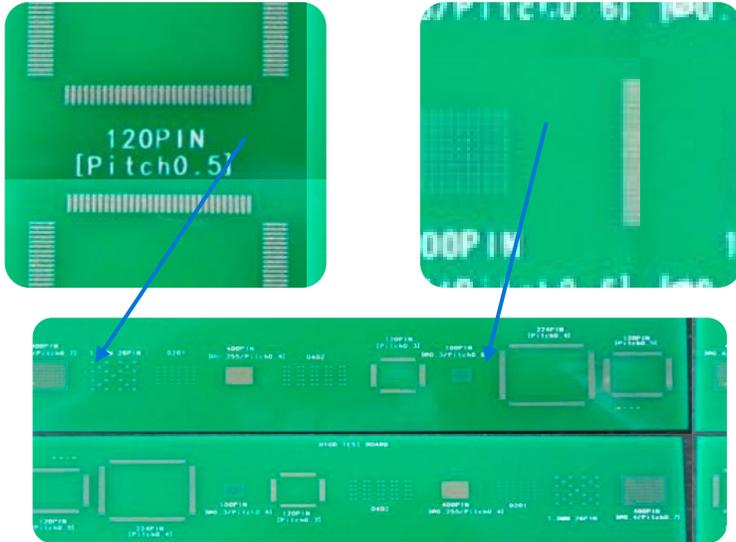
Other



Solder paste were covered BGA & IC completely

Solder paste were shifted on BGA and lacked on IC

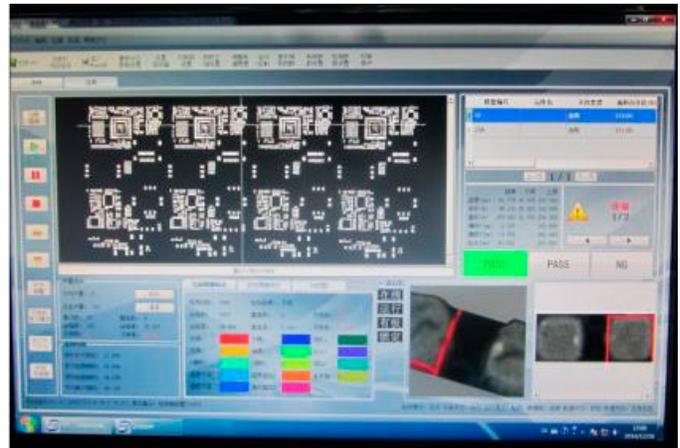
Conclusion: Printing result is perfect, no misalignment, shift, solder bridge, lack solder, etc.



Use same sample to test H450 and other brand to check IC and BGA

## Printing Result Comparison (SPI)

### SPI inspection



### SPI inspection result:

Production QTY: 192PCS  
 Pass QTY: 189PCS  
 Defective QTY: 3PCS  
 Pass rate: 98.438%  
 Defective rate: 1.562%

Conclusion: This PCB has many difficult IC and small pads , after inspection, result is good , H450 can ensure printing quality and accuracy in production line

|                          |  |
|--------------------------|--|
| TECHNICAL DATE: H450     |  |
| Maximum PCB Size (X x Y) | 450mm x 340mm  |
| Minimum PCB Size (X x Y) | 50mm x 50mm  |
| PCB Thickness            | 0.4mm~6mm  |
| PCB Warpage              | Max. PCB Diagonal 1%   |
| Maximum PCB Weight       | 6Kg  |
| Plate Edge Clearance     | Up to 3mm  |
| Maximum Bottom Clearance | 16mm   |
| Transport Speed          | 1500mm/Second(Max)   |
| Transport Height         | 900±40mm   |
| Transport Direction      | Left-Right, Right-Left, Left-Left, Right-Right                       |
| Transmission Mode        | One Stage  |
| Clamping System          | Patented over the top clamping /side clamping/vacuum nozzle (option) |
| Support System           | Magnetic Pin/Support Blocks  |
| Print Head               | Two independent motorized print heads                                |
| Frame Size               | 370mm x 470mm~737 mm x 737 mm  |
| Squeegee Type            | Steel/Rubber Squeegee Blade(Angle:45/55/60)                          |
| Squeegee length          | 220mm~500mm  |
| Squeegee height          | 65±1mm   |
| Squeegee thickness       | 0.25mm Diamond-like carbon   |
| Print Mode               | Single or Double Squeegee Printing                                   |
| Stencil Snap-off         | 0.02 mm - 12 mm  |
| Print Speed              | 6 mm/sec - 200 mm/sec  |
| Print Pressure           | 0.5kg - 10Kg   |
| Print Route              | ±200 mm(from central )   |
| Imaging Horizon (FOV)    | 6.4mm x 4.8mm  |
| Adjustment Range         | X,Y:±7.0mm,θ:±2.0°   |
| Vision System            | Look Up/Down Optics Structure/CCD/Geometry Pattern-match             |
| Repeat Position Accuracy | ±0.01mm  |
| Printing Accuracy        | ±0.025mm   |
| Cycle Time               | ≤7s  |
| Changeover Time          | ≤5mins   |
| Power Supply             | AC220V±10%,50/60HZ,15A   |
| Air Supply               | 4~6Kg/cm2, 10.0 Diameter of Tube                                     |
| Operating System         | Windows XP   |
| Machine Dimensions       | 1140mm x 1400mm x 1480mm   |
| Machine Weight           | 1000Kg   |