KEKO EQUIPMENT

CHOSEN BY LEADING COMPONENT MANUFACTURERS WORLDWIDE

FULLY AUTOMATIC WET MULTILAYER COMPONENT MAKER FEP-10

- Accurately forms thin ceramic layers
- Excellent alignment of screens and ceramic (5 micron accuracy)
- Prints via electrode with a stencil or screen
- Flexible design matches your process
- Horizontal drying ovens save precious floor space
- High productivity, at the lowest cost per component
- Pneumatic screen positioning system

Low cost bulk production

FEP 10 is the first wet stack inductor machine[1] available on the open market. The fully automatic machine accurately deposits thin ceramic layers on the carrying plates to build up the multilayer stack. The metal paste printers on the machine can be used for various purposes to add flexibility to the process or make different components. For the fabrication of inductors one printer is used to print the via fill, the other to print the coil structure. Plates travel around on a carousel to build up the multilayer structure. By shifting screens between fixed A and B positions, the electrical designs suitable for inductors, and also MLCC and filters, can be realized in an economical fashion. The machine is fully computer controlled, allowing for fully automatic operation. However, local panels with each printer or ceramic layer deposition unit also allow easy access to operators for changing screens, etc.

The machine is designed to maintain fully stabilized process conditions for each layer deposited. Block temperature is carefully controlled by a cooling system to the ideal conditions of printing and layer deposition. Accurate alignment of all screens is obtained by using an intermediate frame. Screens are fixed on the frame with a screen-centering device featuring an operator-friendly magnified view on a monitor and accurate positioning screws. Screen changing on the FEP 10 is rapid and precise, due to pneumatic holders that fix the screen on the intermediate frame into the printer. The screen is lifted with micrometer accuracy for each layer that is added to the stack. For inductors, A-B shifting is done automatically by means of an inserted mechanical spacer.

Bars are transported on a high-speed belt transporter resulting in a low cycle time – only 5 seconds for single deposits. On the corners each bar is rotated 90 ş. The use of circulating air tower-dryers result in a tremendous saving of floor space.

FEP 10 can be fitted with several options to automate the process even further with automatic paste and ceramic slip supply. In-site measurement of ceramic deposition by laser reflection is available. Individual bars can be marked with bar codes to track the process and individually correct the ceramic deposition process. Carrying plates can be supplied by a cassette system that allows easy handling by operators between subsequent process steps.

The FEP 10 allows the most economical processing available today because: 1) no other steps in the build up process for the manufacture of ceramic components are needed, and 2) the FEP 10 makes the ceramic layers in-site at an incredible pace of 5 seconds per layer without the need of subsequent isostatic compression of produced bars. The flexibility of the FEP 10 also makes it the most suitable equipment for large scale prototyping of completely new component designs.

If your applications require a new feature to be added onto the machine, we will design and build the machine to accommodate this feature, working closely with you to make sure your performance expectations are met.

Fully Automatic Wet Multilayer Component Maker FEP-10

Typical specifications [2]

Palette size:	170 x 170 mm or 6.7 x 6.7 inches up to 254 x 254 mm or 10 x 10 inches
Number of palettes:	1 – 250 pieces
Palette transport:	high-speed belt
Cycle time:	typically 5 sec. (palette to palette)
Time change screen:	<<1 min.
Squeegee speed:	50 – 300 mm/s or 2 –12 inches/s
Snap-off:	max. 10 mm, adjustment with 1 microm. or 1/25 mil accuracy
Dryer:	circulating air heated up to 100 °C
Drying time:	typical 5 minutes, adjustable
Clean air:	tracks fully covered for clean room appl.
Safety:	equipment complies with US and CE safety regulations
Dimensions:	Length 2,920 mm or 114 inches Width 2,920 mm or 114 inches Height 2,340 mm or 92 inches
	Weight approx. 2,500 kg or 5,500 lbs.

- Up to four printers/dryers
- Cassette carrying plate loading system
- Automatic ink and ceramic slip dispensing
- Choice of ceramic printing or slotted die deposition
- Laser ceramic thickness measurement
- Reel feeding systems for coversheet dispensing
- Off-line automated coversheet stacker
- Automatic visual inspection systems: electrode print quality
- Custom designs to meet special requests for your technology

1) Keko Equipment accept no liability whatsoever to infringe on third party patents. Delivery of the equipment does not constitute a licence to use patents.

2) Because our equipment is customized for specific requirements, specifications given are subject to change.

KEKO EQUIPMENT
Grajski trg 15
8360 Žužemberk, SLOVENIA
phone: +386 7 3885 200
Fax: +386 7 3885 203
E-mail: kekoequipment@siol.net
URL: http//www.keko-equipment.com

Sole agent for China & Hong Kong:
Skymos Microelectronics Ltd
Rm 12, 8/F, Topsail Plaza,
11 On Sum Street, Shatin, N. T.
Hong Kong
Tel : (852) 26325088
Fax : (852) 26325028
E-mail : skymos@asiansources.com