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Dainippon Screen Launches Industry’s Fastest Direct Imaging System for PCB
Uses World’s First Multi-wavelength UV LED
And Flexibly Handles Various Photosensitive Materials

Kyoto, Japan – November 1, 2011 – Dainippon Screen Mfg. Co., Ltd. has developed Ledia 5, a direct imaging system*1 for PCB that achieves the industry’s fastest throughput.*2 Ledia 5 uses the world’s first*3 multi-wavelength UV LED as a light source and offers flexible imaging capable of handling any photosensitive material (photo resist). Sale of the system is to start in January 2012.



Ledia 5

Please download the photo from www.screen.co.jp/eng/press/nr-photo_2009-2011.html

Expected start date for sales	January 2012
Expected annual sales (first year)	100 units

To create circuit boards, the PCB industry has conventionally used an exposure method in which light is shone onto a pattern base plate made of film or glass called a photo mask and the circuit is optically transferred to the entire photosensitive area of the substrate. However, in recent years, the rapid penetration of smart phone and tablet devices has increased the requirement for both higher density and precision as well as improved error ratio control and productivity. For this reason, there has been a sudden shift to direct imaging exposure systems, with their ability to achieve higher yields of more precise circuit patterns with no need for a photo mask.

Newly launched Ledia 5 is equipped with a world-first high-intensity UV-LED type exposure head capable of exposing multi-wavelength light as well as a newly designed autoloader. This enables an approximately five-fold improvement in productivity compared to conventional systems and makes Ledia 5 the fastest direct imaging system in the industry. Moreover, as it uses conventional photosensitive material (photo resist) to process PCB, it can easily be inserted into existing production lines, facilitating high-quality production with a low defect ratio. In addition, it is able to handle photosensitive materials that were previously difficult with a direct imaging system using a laser.

Screen intends to position new Ledia 5 as a strategic product in its PCB manufacturing equipment business. As well as acquiring the top share in the direct exposure system field, Screen’s continuing goal as a key company leading the PCB industry is to provide various new products and solutions designed to meet customer needs.

*1. Direct imaging systems for PCB

A system that directly images (exposes) circuit patterns at high-speed and precision onto photo resist and solder resist films on PCB. This eliminates photo mask-related processes from conventional exposure, enabling rapid turnaround and significant cost reductions. The system is able to handle a wide range of production formats from small run production of test PCB for diverse products, etc. through to mass production.

*2. Productivity for a direct imaging system using conventional dry film resist and conventional solder resist. Based on the research of Screen as of October 2011.

*3. Based on the research of Screen for a direct imaging system equipped with this light source as of October 2011.

Note: This system will be introduced at Taiwan Printed Circuit Association Show 2011 (TPCA Show 2011) to be held at Taipei Nangang Exhibition Center in Taiwan from November 9 (Wednesday) to 11 (Friday).

Features

1. High throughput

The adoption of an imaging head using a new light source and autoloader that demonstrates particular power in mass production lines significantly improves processing throughput. This makes a major contribution to the mass production of PCB, which are becoming steadily more high precision.

2. Handling of conventional photo resist

Exposure over a wide range of wavelengths from 350 to 420 nm is possible. The ability to apply the conventional photo resist used in batch exposure systems provides high compatibility with conventional production lines.

3. Adoption of a multi-wavelength UV LED as a light source

A multi-wavelength high-intensity UV-LED light source has been adopted for the first time in the world. As the most suitable curing characteristics can be obtained for the photo resist being used, high-quality imaging with the highest speed in the industry is possible.

4. Adoption of two dimensional modulator projection imaging system

Ledia 5 uses a two dimensional modulator projection imaging system that projects the patterns on a two dimensional modulator onto the surface of a PCB and performs modulated imaging while synchronizing with the transfer stage. The installation of a newly developed high-precision imaging head achieves extremely fine, high-quality imaging of line widths down to 30 μm .

5. Reduction of environmental load

The adoption of a long life LED with low power consumption as the light source has significantly reduced electricity usage. In addition, a reduction in the error generation rate also contributes to a reduction in the volume of PCB materials and photo resist used.

Functions

1. Auto-scaling/self-calibration functions

Ledia 5 is equipped with high-accuracy positioning/imaging position correction control and various self-calibration functions, enabling a high imaging position accuracy of 10 μm or less. In addition, a superposition correction function responds to PCB variations in real time, enabling highly reliable, high-precision imaging.

2. High-precision autofocus function

A high-precision autofocus function has been installed for the imaging head. Details of height changes in the surface of the PCB such as warping or thickness variations are fed back to the imaging head in real time. This allows imaging in a consistently suitable state and contributes to a reduction in the rate of occurrence of imaging errors.

3. Installation of a clamp mechanism capable of securely holding even warped PCB

A clamp mechanism that holds the edge of PCB has been installed in addition to the vacuum suction system. This system securely holds even warped PCB and when used in combination with the high-precision autofocus function, allows even more stable imaging.

4. Support of Sentflow PCB production process workflow system

Linking with Screen's Sentflow PCB production process workflow system enables batch registration of jobs and automatic imaging, which enhances labor-saving and controls human error. In addition, as the exposure history and summary of production results can be widely used, it is possible to manage the production process and reduce the occurrence of errors at the same time.