

Press Release

Viscom and SMT Thermal Discoveries Partnership Successfully Reduces Voids in Power Electronics

Hanover, 18 February 2020 – The X8011-II PCB manual X-ray inspection system from Viscom has now been in use for about six months in the Technology Center of SMT Thermal Discoveries, performing a vital task. Visitors and training course participants at the SMT Technology Center in Wertheim learn firsthand how the special vacuum technology used in the reflow soldering process almost completely eliminates voids in solder joints. The Viscom X-ray inspection system proves the successful results with high-precision before-and-after inspection images.

The rapidly growing markets for renewable energy and electromobility also exert a strong influence on electronics manufacturing: complex assemblies with extremely sensitive power electronics require an efficient manufacturing process that guarantees optimal product quality, i.e. no defects whatsoever. Gas inclusions (voids) in surface soldering can adversely affect product performance and service life. Due to the high currents in power electronics and the resulting high temperatures of the component, these switches require optimal heat dissipation, which is severely impaired by voids.

Innovative Void Inspection

For automatic 3D X-ray inspection, Viscom uses extensive software analyses to detect voids easily and accurately in solder joints of BGA components and LEDs, for example. Moreover, with the aid of Viscom's proprietary XVR computer tomography and a contour-based procedure, X-ray inspection images can be provided with accurate contours. The number and size of the individual voids found as well as the total of all void areas on the assembly are supplied as important parameters for the production process.

Pore Percentage Nearly Zero

The current goal in assembly production is to generate solder joints with minimal pores, which cannot be accomplished with conventional reflow technology. SMT Thermal Discoveries offers a sophisticated inline solution with its vacuum reflow soldering system, which is already in use around the globe. The principle is as simple as it is ingenious: in the molten solder, the shrinkage voids can expand via the negative pressure generated and channelled into the vacuum, i.e. when the gaseous pores reach the surface of the solder joint, they are practically flushed out by the surface tension of the solder paste. Two positive effects result: the pores are significantly smaller after soldering, and the number of pores can be considerably reduced. The Viscom X-ray inspection system at the SMT Technology Center vividly compares the conventional reflow process to the vacuum reflow process in its inspection images.

The Viscom X-ray Inspection System at the SMT Technology Center

In 2008, SMT Wertheim and Viscom began a partnership based on the shared goal of providing optimal support to customers with defect-free, efficient and economical production. The systematic use of automated inspection systems in assembly production ensures that a very high level of quality can be achieved on a sustained basis. "We ensure that solder joints are sound and Viscom inspects the result in a reliable and traceable manner," said Frank Eehalt, process expert at SMT Thermal Discoveries. "Viscom's automatic X-ray inspection system impressed us with its ease of operation, speed and excellent inspection quality. Our customers thus benefit from the highest inspected product quality."

At the SMT Technology Center, electronics manufacturers in the automotive, telecommunications, aviation, medical and defense industries can learn more about the possibilities offered by vacuum technology, which is regularly demonstrated as a test application in seminars. "Even if they are familiar with voids, our guests generally experience a "Eureka!"

moment when the high-resolution X-ray images show the results of the vacuum technology so clearly and incisively," explained Frank Eehalt.

Images and Image Captions:



The Viscom X-ray inspection system inspects the number and size of voids at the SMT Technology Center

(Image file: Viscom_PR_X8011-II PCB_SMT Technology Center_X-ray Inspection)



Frank Eehalt, process expert at SMT Thermal Discoveries, explains the difference between the conventional reflow process and the vacuum reflow process

(Image file: Viscom_PR_X8011-II PCB_SMT Technology Center_Vacuum Module)

About SMT Wertheim

SMT Thermal Discoveries, based in Wertheim, is a recognized expert in the field of mechanical engineering for thermal processes. In recent years the company has positioned itself as a global player with branches in Europe, North America and China, and employs 150 people in five plants at its headquarters in Wertheim. SMT became renowned for its SMD reflow solder systems, among other things, which have been ensuring pore-free soldering results in production processes with vacuum technology since 2009. The company holds several patents and has developed innovative methods such as catalytic process gas cleaning and intelligent nitrogen regulation. Low-temperature and tempering systems as well as UV systems for curing and drying are ideal complements to the proven reflow soldering systems.

About Viscom

Viscom AG develops, manufactures, and sells high-quality inspection systems. Our range encompasses the full spectrum of optical and X-ray inspection systems. In the area of assembly inspection for electronics manufacturing, the company is among the leading suppliers worldwide. Systems from Viscom can be networked and customized to meet specific customer needs. Our headquarters and production site are located in Hanover, Germany. Viscom has a wide international network of subsidiaries, applications centers, service centers and representatives. Founded in 1984, Viscom has been listed on the Frankfurt Stock Exchange (ISIN: DE0007846867) since 2006. For further information, visit www.viscom.com.