No. 30 | 12/2013

Newsletter

Editorial

Volker Pape

Dr. Martin Heuser

Dear Readers,

FastFlow, XM and XM 3D – these were the technological highlights of 2013 for Viscom. Two broad directions are clear: increase in performance and throughput, and enhancement of 3D technology. Viscom offers 3D SPI, 3D AOI, in-line tomosynthesis, off-line tomography and much more, based on 3D reconstructions.

Since the start of AOI development, Viscom has used different views to evaluate 3D features, which it has further developed into complete 3D solutions. And last but not least, state-of-the-art, intelligent software tools make it easy to operate AOI and to efficiently take advantage of process optimization. That „AOI is complicated" is no longer true – especially with Viscom.

Best regards,

Volker Pape
Executive Board
Viscom AG

Dr. Martin Heuser
Executive Board
Viscom AG

XM 3D camera module and Viscom Quality Uplink are well received

Visitor congestion at Productronica

"Total 3D" was the motto under which Viscom scored a bulls eye at Productronica with the presentation of its new 3D AOI camera module and Quality Uplink. From November 12 to 15, the attractive stand in the first row of Hall A2 hit peak period. "From day one, the rising demand for 3D solutions and the generally keen interest in high-quality inspection solutions were bound to create immense interest", said Volker Pape, Director of Sales, International Business and Company Development. „We were able to grow visitor numbers again by around a third from the last Productronica. Many discussions with visitors focused on our all-encompassing 3D solutions and the Viscom Quality Uplink."

Viscom now covers the entire production process with 3D inspection solutions: from solder paste inspection to X-ray inspection operations. The full 3D AOI complements the powerful 2D inspection solution, which already recognizes the vast majority of all defects. It is used primarily where defects are conspicuous, including for tombstoning, coplanarity tests or lifted lead detection. One especially positive feature is the

continued on page 2 ▶

Contents

continued from page 1

Mirko Weissgerber explains the verification station

simple programming and the immediately understandable measuring technology of the 3D features. "The feedback received from visitors confirmed that we are on the right track", feels Torsten Pelzer, Sales Manager at Viscom. "Our years of commitment to achieving the aim of a ‚zero defect inspection', i. e. greatest inspection depth, even with increasing miniaturization of components and the most demanding inspection tasks has paid off."

The new XM camera module attracted particular interest. The module was demonstrated in live operation in a S6056 AOI. Boasting a speed of up to 20 gigabits per second, this module is one of the fastest AOI camera systems on the market.

Electronics assemblies already could be inspected very reliably by evaluating 3D features, simply using angled camera views from different lines of vision. The XM 3D module is finding acceptance for 3D measuring technology in the AOI End-of-Line inspection. Thanks to complete 3D evaluation and image information from up to nine different cameras – as before – defects in the fine-pitch range can be detected with even greater reliability. Optimized precision in 3D measurement technology is guaranteed by an integrated structured light projector with programmable projection resolution, frequency and phase-shifting.

A resolution of 8 or 16 µm per pixel and four-color illumination allow even the minutest details on miniaturized components to be identified. The outstanding image quality and the high resolution enable also the reliably inspection of 03015 components. The flexible configuration of the camera and the projectors mean that existing AOI systems with 3D technology very easily can be retrofitted.

"The market on the one hand is demanding high-quality inspection systems that satisfy the increasingly stringent criteria for miniaturization and throughput. On the other hand there is also an extremely high demand to evaluate the process as a whole", Volker Pape continues. "Hence the keen interest also in the Viscom Quality Uplink. Developed by Viscom, this approach allows the process to be intelligently evaluated and even controlled." Over the Quality Uplink, all inspection systems communicate with each other to pool their results for controlling the process. "Linking information from solder paste inspections and from End-of-Line AOI allows, for example, defects to be classified with greater reliability at the verification station, and the inspection tasks of the individual inspection gates to be optimally geared to the inspection object. The first pass yield increases, production costs decrease", Pape goes on to explain. "Through to controlling the AOI or AXI inspection using the data from SPI, a great deal is possible."

In addition to the highlights 3D technology and Quality Uplink, Viscom also, showcased the entire product portfolio: AOI systems (Automatic Optical Inspection), wire-bond AOI, 3D SPI (Solder Paste Inspection), as well as automatic (AXI) and manual (MXI) X-ray inspection systems.

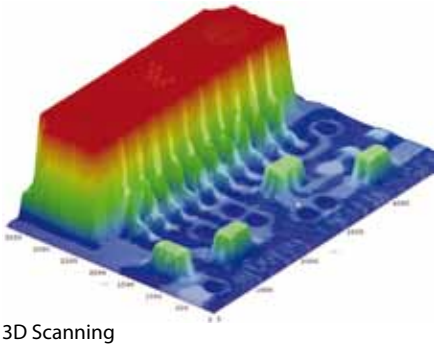
Amongst other products, Viscom presented a S3088 SPI system for 3D solder paste inspection in conjunction with the DEK paste printer and the Viscom Quality Uplink in live operation. The powerful Inline X-ray inspection system X7056 and the X8011 PCB for off-line X-ray inspection were also on show. The X8011 PCB is geared specifically to requirements in SMT and can also be equipped with the Uplink function. All the potentials of the wire-bond AOI on the S2088BO-II desktop system were demonstrated too. "As we had inspection systems on-site we were easily able to get visitors interested in what we can do", concludes Volker Pape. „One thing is certain – Electronica 2014 and especially Productronica 2015 are on our schedule!" ■

Volker Pape at the CEO Round Table Discussion

Tino Mißbach presents the S6056 XM 3D

Total 3D

Viscom presents AOI Module with 3D Technology



3D Scanning

Established in 1984, Viscom has been developing innovative solutions for optical and X-ray inspection for almost 30 years. Working closely with customers, Viscom bases its inspection systems on the latest trends and requirements in SMT production. From the start, the inspection technology was designed to inspect 3D characteristics such as 3D solder paste inspection or the 3D functions of off-line and in-line X-ray inspection, up to the complete µCT. At Productronica 2013, Viscom will present the latest building block in the expansion of the 3D performance spectrum: the 3D function in the AOI high-performance camera module XM.

Increased miniaturization of pads and the resulting greater need for vertical and horizontal resolution were crucial for expansion of 3D technology into end-of-line inspection. The use of angled views already allowed for observation from various viewing directions in order to reliably detect critical errors in the fine-pitch range.

To meet the latest as well as future requirements in electronics manufacturing, not only must the inspection object as a whole be reliably detected, but each individual point of the object as well. This problem is now solved in the XM module with the help of a structured light projector and a multi-step laser triangulation procedure. Here, Viscom relies on the unique, optimal principle of a structured light projector, whose projection is picked up by four or eight side-looking cameras.

In conjunction with the powerful XM module, this configuration produces an optimal combination of all individual measurement principles in the AOI area, creating a comprehensive optical inspection system. With an image acquisition rate up to 1.8 gigapixels/second, the new XM module is extremely fast and because of additional high resolution, it is able to incorporate all information with maximum speed into a highly precise 3D inspection. The unique, flexible camera projector configuration, which uses the existing angular AOI cameras, allows for, uncomplicated 3D retrofit by only installing the structured light projector since the cameras are already present in the AOI system. ■

Viscom Quality Uplink

Five steps for effective process control

Effectiveness not only plays an important role in purchasing, logistics and workflows, but a decisive competitive advantage also is achieved in respect to the inspection concept and the use of AOI and AXI systems by linking information. The Viscom Quality Uplink successfully links SPI, AOI, AXI and MXI. This prevents human false accepts, reduces manufacturing costs and increases the first pass yield.

The Viscom Quality Uplink features a closed loop connection to the paste printer. This allows the SPI to initiate an automated correction of the solder paste printing or optimize cleaning cycles. Additionally, Viscom offers verification of the stencil design in the framework of program generation. The forward loop of the automatic correction of component placement also is possible. When viewing the 3D SPI in the direction of the end-of-line process, the Quality Uplink makes it possible to optimize the SMT process in five steps by linking SPI information with post-reflow AOI, AXI or MXI.

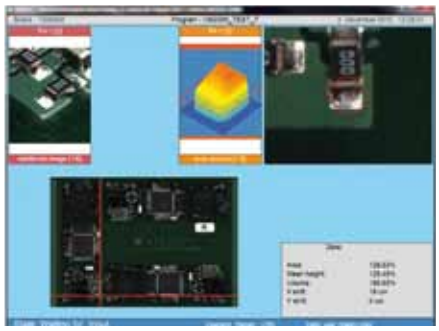
Step 1: Image Uplink – In the first step, the SPI defect patterns are transferred as a bitmap to the post-reflow classification station. After the AOI defect verification, the SPI-only defects are subsequently

continued on page 4 ▶

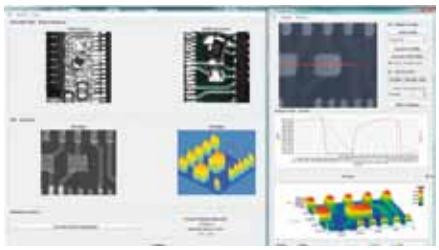
continued from page 3

displayed as well. These are the defects that were detected on the SPI but were no longer noticeable on the AOI since they were corrected during the process. Here, the Image Uplink helps the operator to verify the displayed soldered connection.

Paste Uplink AOI: Linking of SPI image data, inspection results & measurement values with AOI/AXI data for display on the classification station



Additional image acquisitions of solder deposits inspected as defective by the SPI are generated on the AOI/AXI during the postrun.



Process Uplink: Data editing and linking of all inspection gates (SPI/AOI/AXI) – PCB data made available for holistic observation

Step 2: With the Paste Uplink, Viscom offers the option of displaying the results of the paste inspection in the framework of the AOI or AXI defect classification. For all soldered connections of an affected component ID, the 3D and 2D paste information and features are available, regardless of the SPI inspection result. Additionally, the information from all adjacent soldered connections can be called up, avoiding misclassifications (human false accepts) to the greatest possible extent when the result of the solder joint inspection is verified.

Step 3: With the Solder Uplink, additional images of the finished soldered connection for SPI-only defects and/or SPI limit defects are provided automatically. A feature of the Viscom 3D SPI is used to generate so-called 'warnings.' In addition to the categories ‚certainly good' and 'certainly bad,' there is the group of 'paste application in the limit range,' which is especially relevant for paste printing. These views can be recorded orthogonally, angled, in 2D and 3D, and in color. Together, with the detailed information from the SPI, they provide clear indications of how certain irregularities have behaved after soldering. The additional images can come from the AOI as well as the AXI or MXI. This comparison makes it easy to develop the optimum inspection strategy and optimally use resources.

Step 4: TITUS Uplink – As previously mentioned with the Solder Uplink, Viscom distinguishes between marginal defects and definitive real defects, i. e. specification violations, in the paste inspection. Both limits can be defined independently of one another according to the component type. Depending on the paste measurement values, the TITUS Uplink can be used to define the inspection strategy on-line, while taking the AOI inspection into consideration. For example, the rules can be defined in relation to products or components. The configuration takes place on the Viscom SPI and determines rules such as which inspection step is addressed and when. Depending on the inspection result, particular inspection steps can be eliminated or activated, resulting in false call reduction, improved quality and increased efficiency.

Step 5: All relevant AOI, SPI, MXI and AXI data can be saved for later process analysis and quality optimization with the Process Uplink. Using the Viscom Uplink Process Analyzer (VUPA), all defects that have occurred can be subsequently analyzed on an off-line PC. The functions offer direct conclusions about the soldering result and the corresponding paste inspection results. Therefore, the Process Uplink can directly help define optimized defect limits. The advantages include cost reduction, process and quality optimization and complete documentation.

Finally, the wide product range of Viscom systems makes it possible to include the inspection results of the MXI systems (off-line X-ray inspection) in the uplink in addition to the AOI and AXI results. All inspection data from the Viscom 3D solder paste inspection can be displayed at the verification station and compared with the images of the X-ray inspection.

The Viscom Quality Uplink makes it possible to better understand process limits and link all inspection data and results in such a way that they are available where they are needed. This conserves valuable resources and optimizes manufacturing costs. ■

Viscom-Download

Here you will find an detailed article about the subject:
www.technical-articles.viscom.com

Marquardt relies on Viscom S3088 SPI and Quality Uplink

3D Solder Paste Inspection and Process Optimization

Marquardt GmbH of Rietheim-Weilheim (Germany), a leading international manufacturer of electromechanical and electronic switches and switch systems, uses the Viscom S3088 SPI 3D solder paste inspection system. The system detects all essential 3D characteristics of solder paste printing on electronic components, including height, shape, offset, smearing and contamination of the printing. Using the Viscom S3088 SPI system, Marquardt can reliably and quickly check the solder paste print quality. Additionally, the system offers easy operation and, with the Quality Uplink, is an efficient tool for process optimization.

Mathias Jerger (left) and Nico Schmid support the AOI systems at Marquardt. They have integrated the Viscom S3088 SPI system for 3D solder paste inspection.

Marquardt's mechatronic expertise is used commonly in automobiles, power tools, household appliances and industrial systems. "We produce our products in large quantities. In operation, they are frequently under great strain due to frequent switching. Therefore, quality is the decisive factor in our production," says Holger Gerst, responsible for the AOI/AXI inspection systems at Marquardt. "With the Viscom S3088 SPI solder paste inspection system, we detect defects before the electronic components are assembled, which reduces reworking costs."

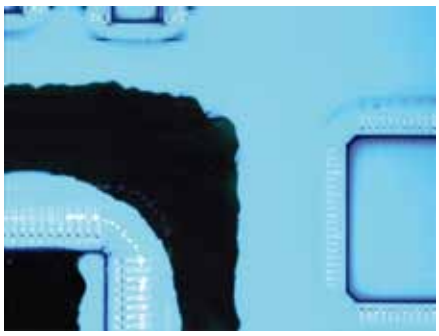
After using a system for 3D solder paste inspection, Marquardt evaluated various suppliers for six months. "We actually had already decided on a different machine when we took another look at the Viscom system," reports Holger Gerst. "In addition to reliable inspection, what ultimately convinced us was that this system had already won the bidding for a sophisticated EU-funded project, and that with Viscom we could formulate individual modifications and implement themin the system."

Marquardt has stabilized its printing process significantly with the Viscom S3088 SPI because all printing parameters can be adapted quickly and precisely. For example, the system immediately analyzes and detects potential problems, such as an incorrectly calibrated printing table or a misaligned circuit board, and informs the operator. "Additionally, we now know exactly how long we can use a template until the next cleaning," reports Holger Gerst. "This reduces line downtime and keeps quality of production data consistently high level."

He continues, "Especially promising is the possibility of linking the SPI results to the results of the EOL AOI, which we soon will be installing in cooperation with Viscom. Until now, we have been able to determine the necessary configuration parameters for our line configuration with Viscom. Next, we plan to install the Quality Uplink function on a production line to reduce scrap, improve first pass yield and thus improve the entire SMT process." ■

Viscom S3088 CCI

Reliable conformal coating inspection of electronic assemblies



The Viscom S3088 CCI inspection system inspects the protective lacquer of electronics assemblies

Transparent protective conformal coating protects electronics assemblies against damage from moisture and wetness. The new Viscom S3088 Conformal Coating Inspection (CCI) system inspects coatings quickly and reliably for typical defects such as cracks, bad spots, layers that are too thin or too thick, smearing, impurities, or splashes. Transparent protective coatings contain UV fluorescent indicators that emit visible light, allowing automatic optical inspection. The Viscom S3088 CCI system features an 8M camera technology with four orthogonal cameras and also is equipped with UV LEDs. The S3088 CCI system is immediately available worldwide.

Electronics manufacturers use the Viscom S3088 CCI at the end of the process chain after lacquering and drying. "The new inspection system that inspects the conformal coating is an integral part of the Viscom product family. The S3088 CCI works with the Viscom SI inspection software, thus offering the same user interface and programming strategy," said Detlef Beer, responsible for product development at Viscom. "This basis makes it possible to implement traceability concepts, special tests such as reading labels with a data matrix code (DMC) and other features. As a result, the system also can be integrated in production control systems, making it a Manufacturing Execution System (MES)."

Technologically, the S3088 CCI is based on the successful Viscom S3088 system. It works with UV LEDs, which contrasts the UV-reactive conformal coating with the background material, clearly detecting the contours of the lacquer. "With a resolution of 11.7 or 23.5 µm/pixel, even the smallest bad areas, contaminations or splashes are clearly visible. These then are classified either as defects or as providing valuable indicators to further optimize the coating process," Beer continued. In this way, the Viscom S3088 CCI ensures that electronics manufacturers reliably comply with the IPC-CC-830 directive for the qualification and performance of electrical insulating compounds for printed circuit boards.

As a result of flexible algorithms, the system can be quickly adapted to different conformal coating methods. Simple inspection programs can be created in only a few minutes. Additionally, it features a good price/performance ratio: An S3088 CCI system is more economical than a classic AOI system. The inspection system is thus intended for electronics manufacturers who apply conformal coatings to large- and medium-sized quantities of electronics assemblies in fields such as automotive engineering, aerospace, industrial electronics and medical technology, among others. ■

Viscom supports women's handball team

Perfect promotion to league 3

Success reaps rewards! Last year was fantastic, seeing HSG Badenstedt's girls' B-team become Germany's handball youth champions. Now, the top ladies team can celebrate being promoted to league three. After their galloping through in the Oberliga, they now rightly stand at the top of the table. However, the rise to a higher league is not without additional costs. Not only are the journeys longer, the entry fees are higher and the requirements for obtaining the trainer licenses are tougher. In addition to that, the German Handball Association (DHB) stipulates that every team must have a minimum level of technical equipment. To make sure this promotion doesn't fail for lack of resources, Viscom has supported the HSG Badenstedt team with a four-figure sum for investments in technical equipment.

The young ladies of HSG Badenstedt

Viscom hopes that this support will reap benefits for the team and is crossing its fingers that the ladies handball team will continue its previous years' success. ■

Lots of children – numerous interesting projects

Viscom hosts the 2013 KiWiZ Research Prize

On June 21, Viscom's headquarters in Hanover were loud and colorful. On this day the competition for the Research Prize of Hanover's KiWiZ e.V. association took place. Over 80 children populated the foyer, presenting their projects with fun and passion.

The association was founded in 2008 with the aim of inspiring children and young people for technical and natural sciences. The specially designed technology kits, which the children in primary and nursery schools use, with the support of their teachers, to develop and realize technical projects with a great deal of fun, form a central element of the initiative. Each year sees a big competition, where a product is built based on tasks set from the fields of construction, vehicle and electrical engineering. The best projects from each field are nominated for the KiWiZ Research Prize. A total of eighteen projects – twice as many as the year before – were finally presented to Viscom before the panel's critical eyes.

Volker Pape, Viscom CEO and panel member, was delighted by the children's wealth of ideas.

"I am just as impressed by the diversity of the work presented by the KiWiZ Research Prize candidates as I am by the quality of this work. The children have shown with great creativity, but also through genuine engineering, that there is more to them than meets the eye. I am so pleased that many schools and teachers have been motivated by the idea of introducing technology to children of primary school age through play. We shall certainly be continuing to support this commitment through KiWiZ and the sponsorship award." ■

The Hanover Kind-Wissen-Zukunft e.V. association received at Viscom AG

Business Run boosts the „we" feeling in companies

Viscom stays fit

„Run from your boss…!" is the motto of the Business Run in Hanover. The 9th run of its kind, well-supported with 3650 participants, took place on May 31, 2013. A Viscom team was also present, using the opportunity to lace up the trainers and compete against other teams.

Due to the flooding the course was changed compared to the previous years and was 7 km long. The Business Run Oscar goes to the group with the most participants and the most creative outfit, not to the group that passes the finishing line first.

It all began at 18:00 hrs. in the Mehrkampfarena in Hanover's multi-sports park. After the weather being rather unfavorable during the afternoon, it looked better right on time for the starting gun at 18:30 hrs.

The Viscom team at the Hanover Business Run

The Viscom team had great fun, albeit not winning a trophy. "But perhaps the group will continue to improve in the course of the next years", hopes enthusiastic Business Run participant Michael Mügge. "The best thing about the event is that it's not about the winning, it's about the team spirit, and that's where our people at Viscom really do deserve a medal."

And it did not, however, end with the run. The organizers had provided sufficient supplies of food. Given such a get-together, the plans have already been forged for the 10th Business Run next year. ■

Viscom Technology Forum and User Meeting

Save the date

Viscom is extending invitations to the Technology Forum and User Meeting in Hanover. The event features top-class speakers who will offer insight into current trends and developments in the field of electronics manufacturing. ■

www.viscom.de

Imprint

Publisher:
Viscom AG
Carl-Buderus-Str. 9 -15
30455 Hannover
Tel.: +49 511 94996-0
Fax: +49 511 94996-900
info@viscom.com
www.viscom.com

Editor:
Martina Engelhardt
Tel.: +49 511 94996-531

Graphics and Layout:
Gaby Reglitz

www.viscom.com

#Viscom_NL_30_12/2013_EN