Keeping things in perspective - AXI technology as a guarantee of quality at MSL Circuits

Electronics manufacturing has undergone extraordinary development in recent years. Miniaturisation of components, increasing complexity of package types and rising performance requirements have made quality assurance in electronics manufacturing an ever-greater challenge. In this context, automatic X-ray inspection (AXI) has established itself as an important step in quality assurance.

The importance of automatic X-ray inspection (AXI) in quality assurance becomes particularly clear when looking at the results of the French ALL Circuits Group. This leading EMS company in electronics manufacturing has recognised the importance of AXI technology in ensuring product quality. This top player in the industry specialises in industrialisation and manufacture of high-quality electronics solutions and produces more than 440,000 PCBs and electronics products daily for the entire world in four production facilities. Established player MSL Circuits, one of the two French production sites for global EMS service provider ALL Circuits, has 30 years of experience in automotive electronics. The company has recognised that state-of-the-art, validated electronic components play a significant role in modern vehicles, whether in the powertrain, occupant comfort or improved security. Therefore, the electronic PCBs manufactured by MSL Circuits must meet the highest quality standards.

Figure 1: MSL Circuits production site in Meung-sur-Loire, France (source: MSL Circuit)

Improved inspection capabilities through AXI technology

Increasing demands on the quality of electronic PCBs require innovative approaches in inspection technology. To meet these requirements, MSL Circuits relies on AXI technology, because for increasingly complex PCBs and the introduction of new components, X-ray inspection systems offer improved inspection options. Hidden solder joints, voids and other quality problems can be reliably detected. Especially for EMS service providers, this is essential due to high quality standards and high cycle rates. However, this also offers the opportunity to inspect new component types (BGA, Fine Pitch ICs, Power MOSFET,...) to meet the increasing requirements and to offer specialised know-how.

Press Contact:
GÖPEL electronic GmbH
Christina Schellbach
Göschwitzer Straße 58/60
07745 Jena, Germany

Tel.: +49 (0)3641-6896-739
Fax: +49 (0)3641-6896-944
E-Mail: presse@goepel.com
Web: www.goepel.com

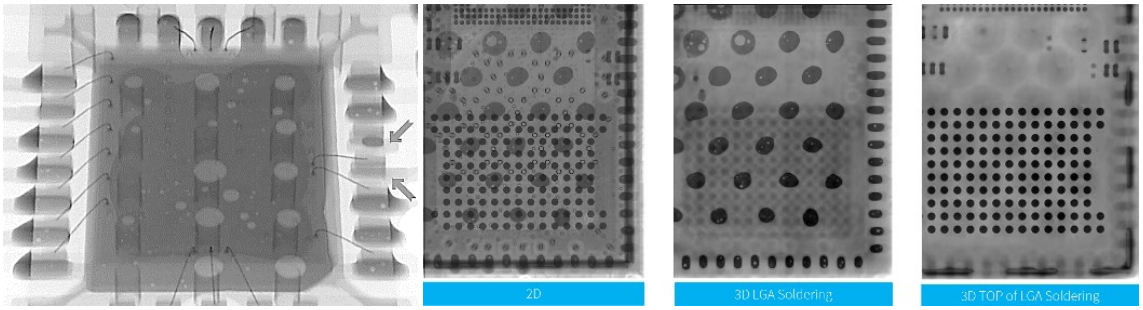

Figure 2: left: QFN inspection, right: LGA inspection – only possible with 3D X-ray technology (source: GÖPEL electronic)

Criteria for AXI system selection at MSL Circuits

The selection of a suitable AXI system was significant for MSL Circuits. In 2020, the process of identifying and evaluating potential systems began. The decision for an automated X-ray inspection system in 2022 was influenced by several significant factors, taking into account various criteria, including working conditions, technical support and the performance of the machine in relation to the electronic PCBs used. In the end, the decisive factors were the speed and reliability of the measurements, which fulfilled the system's performance criterion. Fast and comprehensive service was also decisive. From a technical point of view, it was also important to develop specific detection algorithms and to enable the acquisition and control of the data associated with the system.

Figure 3: X-Line from GÖPEL electronic (source: MSL Circuit)

AXI for quality check and process optimisation

At MSL Circuits, AXI technology is used daily for a variety of inspection tasks in the automated SMT line. These include inspection of hidden solder joints or detection of voids, as well as inspection of components mounted under shields and detection of lifted pins to add to and complete the test coverage of other test tools. These tests are essential for quality assurance of manufactured PCBs. For new product development, MSL uses AXI technology to validate and qualify all its soldering processes (Solder Past, stencil and reflow). Therefore, when these products go into full production

Press Contact:
GÖPEL electronic GmbH
Christina Schellbach
Göschwitzer Straße 58/60
07745 Jena, Germany

Tel.: +49 (0)3641-6896-739
Fax: +49 (0)3641-6896-944
E-Mail: presse@goepel.com
Web: www.goepel.com

mode, we guarantee our customers the integrity of our process during this validation step, followed by 100% monitoring or sampling.
To this end, and in order to continually improve electronics production in the future, consistent and continuous analysis of production data and statistical evaluations are of the utmost importance.
In addition, these X-ray inspection machines need to be reliable. For this purpose, GÖPEL electronic offers tailored preventive maintenance and a competent support partnership.

Figure 4: SMD line at MSL Circuits (source: MSL Circuit)

MSL Circuits wants to adapt to this dynamic development in the electronics industry. This includes optimisation of production processes to be able to act even more efficiently. Furthermore, the introduction of new components such as BGAs, requires adapted test procedures and with increasingly complex PCBs,testing for voids is necessary. Finally, there are also considerations to extend AXI technology to other processes in electronics production.

MSL Circuits' test strategy is based on a fine-tuned test coverage analysis. This integrates AXI technology as a powerful complement to other inspection methods such as automated optical inspection (2D and 3D) and electrical testing (in-circuit and functional). This ensures that the manufactured PCBs meet the highest quality standards and that the processes remain flexible and productive.

Conclusion

AXI technology has undoubtedly established itself as an indispensable tool for quality assurance of assembled PCBs. Industry leaders such as MSL Circuits consistently rely on innovative solutions such as the X-Line system from GÖPEL electronic to ensure that their products meet ever-increasing quality requirements. With a clear focus on quality and continuous improvement, MSL Circuits is well positioned to confidently meet the future challenges in electronics manufacturing and continue to offer first-class electronic components.

Press Contact:
GÖPEL electronic GmbH
Christina Schellbach
Göschwitzer Straße 58/60
07745 Jena, Germany

Tel.: +49 (0)3641-6896-739
Fax: +49 (0)3641-6896-944
E-Mail: presse@goepel.com
Web: www.goepel.com

Authors:

Christina Schellbach, Public Relations Manager at GÖPEL electronic GmbH

Andreas Türk, Product Manager AXI at GÖPEL electronic GmbH

Press Contact:
GÖPEL electronic GmbH
Christina Schellbach
Göschwitzer Straße 58/60
07745 Jena, Germany

Tel.: +49 (0)3641-6896-739
Fax: +49 (0)3641-6896-944
E-Mail: presse@goepel.com
Web: www.goepel.com