



Keynote speaker:

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Title of the Presentation:

How to fulfill reliability demands for future electronic assemblies

Short CV:

Vladimír Sítko is a founder and managing director of PBT Works s.r.o, a recognized manufacturer of cleaning systems for electronic assemblies, stencil, and microelectronic applications.

He was starting his career in the microelectronics industry as a developer of the mechanical and physical measuring instrument and production machines for prototyping for chip process, assembly, and encapsulation. Later he was engaged as a process project engineer for vacuum electronic component production.

In 90-ties, he founded an SMT process machines and materials supply and consulting service company PBT Roznov. He gained deep expertise in the soldering process, paste printing process, and PCBA cleaning. At the same time, he was starting the business with development, design, and manufacturing machines for PCBA and maintenance cleaning, which is now running under PBT Works s.r.o. He is participating in several research tasks for cleaning technology. He sets concepts of PBT cleaning machines and process optimization methods. He is also working on the development of new measuring instruments for cleaning parameters monitoring and performance enhancements. He is an owner or co-owner of several patents.

Abstract:

The main drivers of rapid process development are 5G, the Internet of Things, and the development of hybrid, electric, and autonomous electric vehicles. Communication is using transfer frequencies in the GHz band. Such high rates require a completely new strategy in assembly interconnections. All paths in assemblies must be as short as possible, w/o parasitic inductances and capacities. Packages on assemblies will be almost only BTC (bottom terminated components). In the transport industry, the processed voltages at power transmission are higher than before. The tendency is to increase the voltage in cars from 12 – 24 V to 500 V to save weight and increase the driving distance.

Manufacturers still hope to continue using NO-CLEAN soldering technology for such applications. But all these assemblies are more involved in human safety and life protection. It has to be in the future much more reliable than current status. The vision is to increase the lifetime of automotive electronics from 15000 to 130 000 hrs. Both automotive and communication devices have to work in harsh environments. Ionic cleanliness and high Surface Insulation Resistance (SIR) are critical. This situation will, in a short time, move post soldering cleaning to standard technology for all reliable assemblies.

The big challenge is that for all these requirements on cleanliness, the current test and qualification methods are not suitable.

In modern production, the machine has to communicate important information with the factory MES system (Manufacturing Execution Systems). Information, like machine activity and status for central evidence of process exploitation and effectiveness, operator's logging, process data important for decision about the successfully passed operation, etc.

Also, such machines have to be ready to cooperate with robots and Autonomous guided vehicles to be integrated into the state of the art manufacturing lines, where a big part of maintenance and handling of material runs without operators.

Such a concept of cleaning machines can satisfy rapidly growing demands on the performance and effectiveness of the cleaning process. The complexity of assemblies and increasing needs for cleaning is a clear trend for the future.