Publishable Summary

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Proposal Number:	FP7-SME-2008-2/243626
Project Title:	Advanced Surface Protection for Improved Reliability PCB Sytems
Project Acronym:	ASPIS
Start date:	1st October 2010
Duration:	36 months
Website:	http://aspis-pcb.eu

SEVENTH FRAMEWORK PROGRAMME

Aspis - Publishable Summary

The three year Aspis 'Research for SMEs' project has been conducted to address problems found with the nickel gold (ENIG) solderable finishes that are used by the electronics industry to enable components to be soldered to printed circuit boards (PCBs). ENIG has several key advantages over other types of PCB solderable finishes and these are highly significant, making ENIG the preferred choice for many applications. However, while ENIG coatings have a good reputation for excellent solderability, they can also be prone to a number of well known reliability problems, such as 'black pad', whose formation mechanisms were still poorly understood. When ENIG-related problems occur, they lead top device reliability issues and premature failures. They can also affect an entire product design or batch and the problems are often only identified after assembly, during which expensive components have been soldered to the PCBs.

The ASPIS project has focused on the development of new chemical processes that can avoid black pad and related problems and which also offer enhanced reliability performance, as well as methods for detecting ENIG related issues. Through four individual key work packages, a multi-faceted approach to ENIG reliability problems has enabled significant progress to be made on all fronts. The ASPIS project has carried out work to reduce the likelihood of ENIG-related problems occurring by improving the coating deposition technologies. Via specific work packages on metal plating development, the ASPIS project investigated the formulation of new processes that will enable thinner coatings to be employed, thus reducing the cost of using ENIG while offering reliability enhancements. Another key goal was to develop methods for identifying potential problems related to the use of ENIG on PCBs and a non-destructive screening method has been demonstrated that detected problems on circuit boards before components are soldered. One way to prevent ENIG-related problems is to avoid them altogether by using different coating technologies. With work carried out by partners ITRI and Leicester University, the project successfully developed alternative deposition methods from both aqueous solution and ionic liquids. Several new gold deposition processes were also successfully developed and demonstrated.

The knowledge outputs of the ASPIS project could eventually be used to help reduce the number of ENIG-related problems reaching production and also to accelerate investigations and appropriate response times. This will enable producers to reduce their associated costs and increase customer confidence in the ENIG process. The development of an assembly line tool for identifying problematic PCBs will reduce lost production costs and lower the risk of field-failures and their potential consequences. The improved and alternative coating technologies developed are now available for further development and if subsequently taken to commercialisation will enable European PCB fabricators and their customers to produce more competitive products via both increased process and assembly yields and to provide higher levels of quality in finished products.

The work carried out in the project has been widely publicised via technical papers, articles in trade journals, conference presentations and posters, as well as via an active website and industry briefing events. This dissemination programme is continuing at the end of the project, with a view to forming further collaborations that will help exploit the Aspis developments.