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Surface treatment of metals and manufacture of printed circuit boards are two similar areas of industrial activity. They are dominated by small enterprises, and face growing pollution problems and competition from regions where labour is cheap and environmental legislation less stringent. The Prosurf Coordinated Action is identifying market and research trends in the sector. By linking the SMEs in an information network, it will encourage them to take part in research projects for the first time.

This should help them to improve their practice and introduce new processes and products with added value. These measures should create employment and safeguard the economic future of the sector.

There are many small businesses in two closely related fields of industrial technology: the surface treatment of metals and the manufacture of printed circuit boards. Like many small firms, the majority use the technology that they know and rarely have the resources to take part in research and development programmes. Most of them employ fewer than 20 people. Yet the two sectors are both under commercial pressure and would benefit by upgrading their processes and practices. The Prosurf coordinated action, in the part of FP6 that is devoted to stepping up economic and technological intelligence, is focused on developing a research and innovation strategy to meet their needs.

Sectoral problems

“These SMEs need to increase the level of their technology and become more competitive,” explains Dr Ian Dalrymple of C-Tech Innovation Ltd, UK, who coordinates the Prosurf project. “One problem common to both areas is the increasing need to be aware of environmental concerns. Both industries rely on a multitude of chemical processes, many of them toxic and capable of causing significant harm to the environment.”

Surface finishing implies anything that alters the surface of a metal or gives it a coating to improve its properties. It includes plating, anodising, etching and phosphating. Many such processes use water-based toxic solutions containing metals like cadmium and chromium and corrosive acids, which give rise to serious effluent problems. Printed circuit boards (PCBs) are crucial components of electronic assemblies and their manufacture often includes metal-finishing processes. PCB makers need to find alternatives to lead solder and harsh cleaning materials.

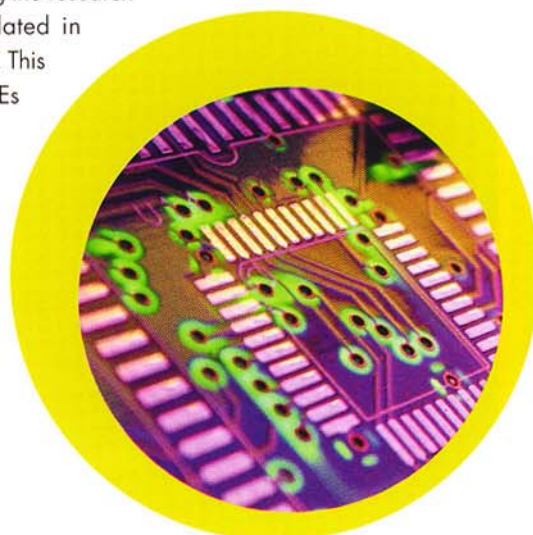
In Europe, legislation to protect the environment is becoming ever-more demanding, a burden that is not shared by competitors in the Far East, where labour costs are also much lower. PCB makers in particular are under great market pressure. The way for these companies to maintain their market position is to boost their technology so that they can make better products that will command a higher price than the current output. They also have to continue the improvements they have made in environmental protection, with cleaner processes, taking into account end-of-life issues like recycling and safe disposability.

Boost for technology

Much EU research has already been invested in technological improvement, driven by environmental pressure. It has resulted in some lead-free solders for PCB manufacture and reduced chromium content for some plated finishes. “Much more work is needed, however, to increase the range, complexity and value of products available,” comments Dr Dalrymple. “Prosurf will establish mechanisms for introducing more sophisticated technology and increase employment and skill levels in these SMEs.”

The project will start by analysing the needs of the sector for new technology and market information. Collecting this information is no mean task in view of the large number of small companies that have to be canvassed. The analysis will look at the innovative potential of current research and generate a research strategy and a road map for its implementation. It will also gather market intelligence, analysing economic trends and identifying opportunities. “This project can only succeed with good information,” says Dr Dalrymple. “Networking and dissemination will be vital to integrate the sector. We are setting up a web-based platform to coordinate communication with the SMEs and creating more specialised groupings within the sector. They will be able to influence the course of the project.”

A further goal is to establish best practice for implementing the research strategy formulated in the initial stages. This will help the SMEs to gain access to emerging and future



R&D programmes, maximising the benefit obtained from them. A test of success will be the involvement of surface finishers and PCB makers in proposals and projects for the next Framework Programme.

"Increasing the level of technology in this field and bringing out new products will make this sector more viable in tomorrow's markets," concludes Dr Dalrymple. "New methods to prepare aluminium coatings, which are very difficult and expensive to achieve at the moment, constitute one objective. Another is to eliminate water-based electrolytes completely, and replace them with ionic liquids which have a salt-like structure but are liquid at room temperature and increase the range of possibilities." Such developments will advance the state of the art, modernise the sector and secure its future.

Project title

Promotion and Support of SME Research and Innovation in the Surface Finishing and Printed Circuit Manufacturing Sectors

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