

Knowledge Transfer Partnerships

KTP BENEFITS

Knowledge Transfer Partnerships are designed to benefit everyone involved

- 🔄 Businesses will acquire new knowledge and expertise
- 🔄 KTP Associates will gain business-based experience and personal and professional development opportunities
- 🔄 Universities, colleges or research organisations will bring their experience to enhance the business relevance of their research and teaching

Knowledge Transfer Partnerships

Accelerating business innovation;
a Technology Strategy Board programme

<http://www.ktponline.org.uk>

MAST CARBON TECHNOLOGY LIMITED KTP HELPS COMPANY DEVELOP NEW FILTER TECHNOLOGY

ABOUT THIS CASE STUDY

Mast Carbon Technology Limited formed a partnership with the University of Bath for this successful Knowledge Transfer Partnership (KTP). The aim was to design and develop a new solvent recovery filter system.

ABOUT THE SPONSOR

The Engineering and Physical Sciences Research Council (EPSRC) is the UK Government's leading funding agency for research and training in engineering and the physical sciences.

FAST FACTS

- 🔄 KTP helped to extend the business beyond its original business focus
- 🔄 The company has designed and developed a novel solvent recovery filter
- 🔄 KTP is expected to lead to a significant increase in turnover
- 🔄 Associate employed by the company
- 🔄 New research opportunities for University staff

The Company

"KTP has helped to us grow a research and development company into one which can manufacture and sell its own novel products based on structured synthetic carbon."

Steve Tennison, Managing Director, Mast Carbon Technology Limited



Mast Carbon Technology Limited was established in 1995 to research, develop, manufacture and sell products based on high purity, controlled pore structured synthetic carbon. The company was predominantly involved in research and development (R&D) to find ways of using these novel carbon materials for specific client applications. The company now has two sites in the UK: one based in Plymouth which specialises in the manufacture of activated carbon textiles and the other, based in Guildford which focuses on research into synthetic activated carbon.

L to R: **Professor Barry Crittenden** and **Dr Semali Perera**, University of Bath; **Dr Edwin Crezee**, KTP Associate and **Steve Tennison**, Managing Director of Mast Carbon Technology Ltd and LMC Chairman for the KTP.

ABOUT THE PROJECT

Mast provides research and consultancy based on synthetic carbon materials for a wide variety of applications including particulate in a wide variety of forms - particulate, monolithic and fabric structures. Mast had worked with the University of Bath for several years. It sought Bath's help and that of a KTP project to develop a new process for the recovery of solvent vapours from the air in factory environments. The main aim was to transfer the design capability of the adsorption process from Bath to the company. Mast also wanted the project to manage the move from a laboratory device to prototype and then into commercial sales.

BENEFITS

The KTP has enabled the company to develop a novel product for its synthetic carbon material. The device has the ability to heat quickly without recourse to steam, for example. This allows for a very short adsorption and desorption

cycle time which leads in turn to a dramatic reduction in both the amount of carbon required and the energy needed within the process. Overall, this can reduce the cost of solvent recovery by 80% and allow the direct recycling of the solvent to the process.

As well as meeting the primary aim, the KTP project has also established methodologies for modelling adsorption from basic principles to allow an accurate prediction of adsorbent performance. This has been implemented alongside the capability for evaluating adsorbent performance for different challenges. Lastly, the project had helped to establish the methods of construction and then how to refine and demonstrate the production of the monolithic adsorbents.

In the short term, the additional skill base in the modelling and design of adsorption processes has given the company the capability to respond directly to enquiries regarding the use

of its materials. Following the design and installation of field test facilities, Mast can proceed to selling the product and forging a major new sector of the company.

During the KTP project, Mast has changed from being an R & D company to a small-scale production company. The work carried out in the KTP project is still in the development stage but has already established the potential for new markets for Mast with significant export potential.

RESULTS

- 🔄 KTP should lead to a significant increase in turnover
- 🔄 Provided the foundation for the manufacture and sale of a novel solvent recovery filter system
- 🔄 Led to a significant investment in new laboratory test facilities and production equipment
- 🔄 During the course of the KTP the company has expanded and 10 new members of staff employed

The Associate

“The project has enabled me to learn and apply skills within an exciting new area and furthered my knowledge and career in the process.”

Dr Edwin Crezee, KTP Associate

BENEFITS

The Associate was able to draw on his PhD in chemical engineering to manage the success of this project. He helped to create the first market-ready VOC filter and recovery devices using carbon monolith technology. The work has entailed translating theory into practice within a busy manufacturing company. The Associate has learnt new skills in sales, project management, problem-solving, leadership and risk management. His achievement in establishing test capabilities for adsorption processes is demonstrated in his subsequent employment within the company.

- 🔄 KTP has provided personal, academic and career development
- 🔄 Greater experiencing of developing designs through to final prototype
- 🔄 Achieved membership of the Institution of Chemical Engineers
- 🔄 Associate has accepted a post within the company

The Academic Partner

“The KTP partnership has been instrumental to cementing a strong collaborative partnership with the company and we are building on this for future mutual advantage.”

Professor Barry Crittenden, Lead academic, Department of Chemical Engineering, University of Bath



BENEFITS

Collaborative research between the University and the company has made a significant impact on teaching within the undergraduate design projects and the taught MSc research work. There are also mutual benefits from the longer-term research on the use of monolithic carbon adsorbents. New challenges are currently being explored with the company regarding potential new KTP projects.

RESULTS

- 🔄 Greater links with an industrial partner
- 🔄 Opportunities for new research and papers
- 🔄 New KTP projects in negotiation
- 🔄 Enhanced profile for the Department of Chemical Engineering