

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>

PIEZO COMPOSITE TRANSDUCERS LTD KTP BRINGS NEW KNOWLEDGE AND PRODUCTS TO A SPECIALIST MANUFACTURER

ABOUT THIS CASE STUDY

This Knowledge Transfer Partnership (KTP) project saw the successful partnership of Piezo Composite Transducers Ltd and the University of the West of Scotland. The aim was to develop broadband high-power ultrasonic transducer devices.

ABOUT THE SPONSORS

The **Scottish Government** is the devolved Government for Scotland. It is responsible for most of the issues of day-to-day concern to the people of Scotland, including health, education, justice, rural affairs, and transport.

The **Technology Strategy Board** is a business-led organisation established by the Government. Its mission is to accelerate research into, and development and exploitation of, technology and innovation for the benefit of UK business - building economic growth and quality of life.

FAST FACTS

- 🔄 Annual value of exports has risen to £400,000
- 🔄 Employment opportunity for the Associate
- 🔄 New research opportunities and teaching material for University staff
- 🔄 KTP has helped develop new transducer devices
- 🔄 Improvements in acoustic modelling and manufacturing process
- 🔄 Annual sales turnover increased to £750,000

The Company

"The KTP has had a major impact taking our business forward. We have grown in size, technical knowledge, manufacturing capability and improved commercial performance."

Mark Walsh, Managing Director, Piezo Composite Transducers Ltd

Established in 1997 and based in Aberdeen, Piezo Composite Transducers Ltd (PCT) designs and manufactures bespoke high performance acoustic transducers for a variety of demanding applications in underwater, non-destructive testing and medical markets.

ABOUT THE PROJECT

The Company's Piezo-composite technology involves either moulding or dicing piezoceramic into an array of rods that are surrounded by a polymer matrix. The construction enhances the acoustic performance and has the advantage of increased sensitivity and bandwidth. The Company predominantly uses two types of

composite: 1-3 and 3-1. It wanted to build on its current success by developing these as single layer transducers and also by developing a low-frequency multilayer 3-1 transducer. PCT contacted the University of the West of Scotland because its Microscale Sensors research group was known to have the relevant specialist experience.

BENEFITS

The KTP project has been a resounding success which has exceeded its original objectives. In meeting the key technical objectives, the project has also sourced new materials for backing and matching layers and acoustic windows. As part of this process, it has been necessary to develop techniques for

characterising these materials and this has resulted in improvements in acoustic modelling.

The Associate has been able to assume the skill level necessary to enable him to take over the role of Acoustic Design Engineer and Project Manager. This has meant that PCT's Managing Director has been able to focus on company growth and development rather than to oversee engineering design. Furthermore, the Associate has been able to increase the scope of the KTP project by developing a greater understanding of electronic matching of ring transducers to maximise the drive from the power amplifier.

The KTP project has brought PCT new knowledge and capabilities. The Company now has a much better understanding of lower frequency transducers. In particular, PCT now has

a method of extending piezo-composites down to 25 kHz. The Company has also improved its knowledge of single crystal material, which has been used in some of the development transducers. Data accuracy and the number of materials has been increased which has improved the accuracy of transducer modelling.

As a result of the KTP, PCT now has several major companies as customers and has needed to increase its manufacturing space to accommodate them. This development reflects the increased customer confidence in the overall capabilities of the Company, its mechanical design, manufacturing prowess and its fundamental ability in acoustic design.

The technical knowledge and competitive advantage gained as a result of the KTP

has enabled PCT to enter a segment of the market which was previously inaccessible, and this has resulted in an increase in annual sales turnover to £750,000. Similarly, the Company is now able to benefit from new export opportunities and the annual value of exports has now risen to £400,000. The KTP project has helped the Company enter a confident period of growth. Over the three-year period after the completion of the KTP project, annual profit is anticipated to rise to £250,000.

RESULTS

- 🌀 KTP has helped develop new transducer devices
- 🌀 Improvements in acoustic modelling and manufacturing process
- 🌀 Annual sales turnover increased to £750,000
- 🌀 Annual profit is expected to rise to £250,000

The Associate

“This is an excellent scheme, I benefited from the experience of working in a fast growing and dynamic business, and from the chance to receive training and support from the University.”

Pablo Marin, KTP Associate

BENEFITS

The Associate brought a PhD in Engineering to this successful project and a background in finite element analysis (FEA). In return, the Associate was able to gain practical experience of working for a specialist manufacturer and learn more about transducer design, project management and commercial aspects of projects. He also had access to specialist training to further the KTP project and benefited from more general tuition in project management, working as a team, leadership styles, design and bringing a product to market. The Associate was offered a position with the Company as an Acoustic Design Engineer.

RESULTS

- 🌀 KTP Associate gained experience of working for a specialist manufacturer
- 🌀 A greater understanding of designing composite transducers
- 🌀 Gained experience in project management
- 🌀 Gained greater commercial awareness
- 🌀 Offered and accepted employment with the Company

The Academic Partner

UWS UNIVERSITY OF THE WEST OF SCOTLAND

“Thanks to the KTP we have been able to participate in a very exciting period of the Company's growth. The Associate provided a good role model for junior researchers at the University.”

Professor Katherine Kirk, Lead Academic, Microscale Sensors research group, University of the West of Scotland

BENEFITS

The KTP project has brought the University an excellent and ongoing relationship with the Company and further opportunities for collaboration. It also sparked exploratory work for a project with a major pharmaceutical company. The KTP has enabled a much greater understanding of how a commercial company operates. There have been excellent opportunities to gain experience in the practical issues of knowledge transfer within a 'friendly' environment during the extended close collaboration, which is promoted by the KTP project format. Alongside the KTP, research at the University has been advanced in various areas including single crystal materials, high-power ultrasound and FEA, providing new case study material and course content.

RESULTS

- 🌀 A greater understanding of how a specialist manufacturer operates
- 🌀 Further collaboration opportunities with the Company
- 🌀 Advances in research and new case study material provided
- 🌀 Increased interest in collaboration with other businesses