

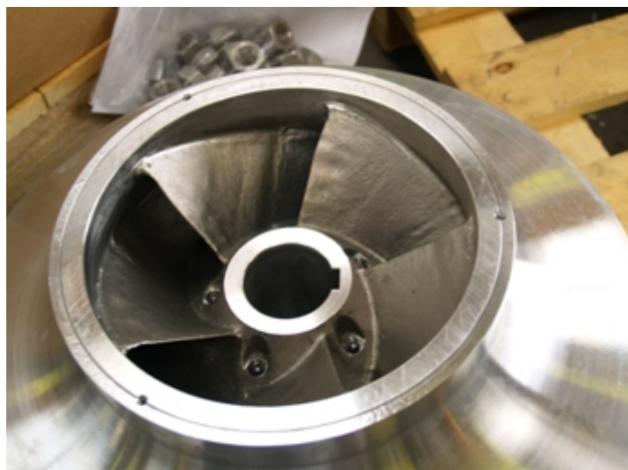
Amarinth Feasibility Study

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Pump manufacturer Amarinth has vast experience of designing and delivering high-performance customised pumps for industrial, chemical and hydrocarbon applications but there remained one particular unmet market need – the total elimination of cavitation no matter what duty. Together with the Integrated Products Manufacturing KTN, Amarinth came up with a state-of-the-art solution that could dramatically improve pump performance. With the KTN continuing to support the company as it sources funding to take its idea forward, Amarinth is confident that its innovation could save industry significant sums of money and tonnes of CO₂ and generate revenue of £9 million a year in the future.

Cavitation has long been a recognised problem in centrifugal pumps – which make up around 70 per cent of global sales. Caused when parts of a pumped fluid are flashed into vapour bubbles which forcefully collapse on the rotating impeller vanes causing pitting and vibration, cavitation results in process inefficiencies, increased energy use, pump downtime and maintenance costs. "We brought together a team of technology experts from across our innovation network to come up with a smart solution that would enable pumps to deal with peaks and troughs of pressure," explains Andy Dean of on behalf of the KTN.



The study confirmed that optimising the design of impellers offered the best opportunity of enabling pumps to operate at their 'Best Efficiency Point' (BEP). A project plan was put together for the research and development of a cost-effective rapid manufacturing process for high value BEP customised impellers incorporating functionally graded structures for increased wear and corrosion resistance. The project will also create an intelligent condition monitoring and control system to maintain operation at the BEP using tunable diffuser vanes so that the pump can operate in the most energy efficient manner.



Above, an image of a centrifugal pump

With the capabilities required for this research extending beyond those of Amarinth's in-house team, the KTN called on its extensive knowledge of UK companies' strengths to involve key innovators and build a consortium. Interest was high – not least because of the platform technology's diverse applications – from chemicals to water to CO₂ sequestration. "The KTN helped us facilitate a project that we would otherwise not have got off the ground," says Oliver Brigginshaw, Managing Director of Amarinth. "Day to day pressures prevent us focusing enough time on the big things that will shape our future. We are very excited about the global impact of this project and firmly believe it will deliver".