UNIVERSITY OF LIVERPOOL

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Novel Design of Cryogenic Pump

A new pump design which requires very low levels of maintenance, decreasing the cost of ownership and losses caused by pump failure.

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Seeking

Commercial partner

About **University of Liverpool**

By facilitating access to our expertise, facilities and networks, the University of Liverpool offers the means to transform ideas into creative solutions, improved performance, new technologies, strategies, applications, products or skills.

Tech Overview

A team at the University of Liverpool has designed a novel cryogenic pump that offers significant advantages over pumps currently on the market. The design originated from a research project where the team needed to circulate ultra-pure argon as part of a physics experiment using a particle detector. To protect the experiment, the pump needed to be extremely reliable, ensure that the Argon did not contain acquire contaminants due to wear of the metal components, and provide precise control over the flow at very low flow rates.

Benefits

The final product design is for a cryogenic pump which has the following advantages over pumps already on the market:

- Rugged and reliable design that contains a back-up system to protect the high value equipment used in the original experiment. As well as being ideal for the research environment, the system would function well in any application where maintaining liquid flow is critical.
- The design means that the pump requires very low levels of maintenance, decreasing the cost of ownership and losses caused by pump failure.
- The pump is immersible in cryogenic liquid.
- The design is virtually friction free which means it has a low heat input.
- There are no sliding metal parts which ensures that the cryogenic liquids are not contaminated by wear products. The pump is ideal for use in situations where gas/liquid purity is critical.
- The design is scalable which means it can be developed into a range of products that can meet the needs of a wide range of applications.
- The prototype design allows for flow rates up to 300L/hour, but also enables precise control of much smaller flow rates; for example as low as a few mL/hour.
- The system does not require differential pressure to pump which means it can be used with open or low pressure dewars, thus ideal for filling systems that cannot be pressurised.

Opportunity

The University team has built a prototype which is currently being tested in-house. Preliminary results are excellent.

The team are currently looking for commercial partners who could help the University take the technology to market.

Advice from a patent agent indicates the design includes patentable features, should interest be secured from a commercial partner or licensee.