

# OFTTech

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L I M I T E D

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## NEWS RELEASE

### **OFTTech Oil Free Helium Circulators using Gas Lubricated Bearings Successfully Running in Nuclear Plant**

**12 September 2016**

OFTTech Ltd has developed an oil-free high speed turbo to circulate helium in the closed circuit of nuclear plants using spiral groove gas bearings, an integral permanent magnet motor and a novel shrouded centrifugal wheel. The first of the production is running in the French nuclear plant at Institut Laue-Langevin which is one of the leading European neutron sources.

The 1 kW integral permanent magnet motor and high frequency KEB drive rotate the shaft up to 50,000 rpm and the spiral groove bearings support the shaft on a layer of helium only 10 micro-m thick. The use of gas bearings and the hermetic design ensures an absolute leak proof machine and the avoidance of any rotating seals. This provides perfect cleanliness which is essential in the nuclear helium circuit, and the hermetic unit is designed to avoid all contact between the circulated helium gas and construction materials likely to add unwanted contamination to the circuit (Cu, Fe). The only materials in contact with the helium are passivated SS316L, carbide ceramic or nuclear approved O rings and the unit is designed for 20 years' continuous operation. Latest SLS manufacturing techniques enabled the use of a fully shrouded centrifugal wheel and laser grooved bearings with a DLC coating to reduce friction. Manufacture, assembly and testing were undertaken in the UK using 98% UK suppliers and the product is fully CE marked.

This opportunity arose through the auspices of the UK industry liaison to CERN, ESRF and ILL at the Science and Technology Facilities Council.

OFTTech Ltd is an SME, in existence for over 30 years, concentrating on the design of oil-free technology using gas lubricated bearings of the spiral groove type. One of the notable successes being the gas bearing design for the MELFI Brayton cycle machine which has been in orbit in the International Space Station since 2006.

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Over recent years, OFTtech has branched out into providing a consulting service for complete high speed rotor design by world-renowned experts for electric motor design and CFD aerodynamic design of turbines and compressors. OFTtech has developed its own in-house software for many design functions and also uses the leading FEA system ANSYS for thermal, structural and CFD analyses.

#### Useful links:

- [www.ofttech.com](http://www.ofttech.com)
- [www.airliquideadvancedtechnologies.com/file/otherelementcontent/pj/turbo-brayton6965.pdf](http://www.airliquideadvancedtechnologies.com/file/otherelementcontent/pj/turbo-brayton6965.pdf)
- [www.airliquideadvancedtechnologies.com/en/our-offer/space/programs/refrigerateur-melfi-pour-iss.html](http://www.airliquideadvancedtechnologies.com/en/our-offer/space/programs/refrigerateur-melfi-pour-iss.html)
- [www.degraaffengineering.com/en/home/](http://www.degraaffengineering.com/en/home/)

**Contact person: Dr Alex Molyneux** PhD MIMechE CEng  
CEO of OFTtech Ltd with 40 years' experience in the gas bearing business.

**OFTtech Ltd** is currently residing at 3 Bear Street, Wotton-Under-Edge, Gloucester and is looking to move to larger premises.

**The Helium blower test unit** can be seen by appointment at the University of Southampton where it is undergoing electrical tests.

#### Photo Gallery

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