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## LOW VIBRATION VAPOUR SHIELDED CRYOSTATS FOR WIDE BORE HIGH FIELD MAGNETS

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With the introduction of new wide bore, high field magnets up to 19 Tesla at 150mm and 15 Tesla at 270mm cold bore, new large insert designs have led to an interest in low vibration measurements with large sample sizes at low temperature. Oxford is developing a new generation of high persistence, high field, wide bore magnets moving on from the current generation of driven magnets requiring improvements with respect to helium consumption.

Large cryostats tend to have large helium consumption and traditional nitrogen shielding cannot be used due to the very high vibration from boiling nitrogen. Even with vapour shielding, there are challenges to reduce helium use and associated vibration. This paper describes the latest developments using high enthalpy shielding with liquid nitrogen pre-cooling. This can dramatically reduce helium consumption without the need for other cryogens and the associated vibration.

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