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## **Influence of tailored MLI for complex surface geometries on heat transfer**

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Complex, non-developable surfaces require a tailored multi-layer insulation (MLI) for lowest heat loads. The most experiments showing the heat transfer through MLI are performed under quasi-ideal conditions determining the principle insulation quality. But the surface to be insulated in real cryostats implies feed-throughs and other non-developable surface parts. The thermal performance of MLI is degraded significantly at cutting points.

To investigate this degrading effect a LN<sub>2</sub>-filled cylinder with a diameter of 219 mm and a length of 1820 mm was insulated with MLI and the heat load was measured calorimetrically. In addition the heat load to an insulated cylinder with eighteen branches was measured. Both the cylinders have the same surface of 1.37 m<sup>2</sup> for a comparison of the results.

This article describes the experiments with different ways of tailoring the MLI for the cylinder with branches and discusses their results.

It was shown that the cutting points at the branches have a significant degrading influence on the thermal performance of MLI.

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