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## **A CTE heat switch for cryogenic space applications near 100 K using UHMW-Polyethylene as actuator material**

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Recently, we designed and built a proof-of-concept heat switch for space applications based on the high thermal expansion coefficient (CTE) of Ultra-High-Molecular-Weight-Polyethylene (UHMW-PE). The initial design showed a reliable switching performance [1]. A new design is proposed which is focused on lower mass and increased reliability, as well as a better understanding of the CTE material behavior at cryogenic temperatures. Measured material properties such as CTE, thermal conductivity, and Young's modulus of UHMW-PE between 330 and 70 K are presented as well as the new switch design.

[1] M. Dietrich, A. Euler, and G. Thumm, *Cryogenics* vol. 59, 70-75 (2014)

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