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# *Numerical and Experimental Investigation of Miniature Cryocooler Constructed in LTCC Technology*

***M. Chorowski, K. Malecha, Z. Malecha, W. Nawrot and Z. Rogala, Wrocław Univ. of Science and Tech., Wroclaw, Poland***

The Low Temperature Cofired Ceramic technology proved its maturity and successful application in number of micro- and nano-size devices and Lab-on-chip systems. It allows stable and controlled performance of number of processes including transportation, mixing, (bio)chemical reactions, detection of micro and nanoliter volume samples. The main advantage of LTCC technology is its manufacturing flexibility and very high endurance. It allows for a safe performance in extreme thermal and pressure conditions. In this study, LTCC technology was used to manufacture a miniature cryoccoler based on Joule-Thomson cycle. The size of the whole device was less than 100mm, the heat exchanger channel width ~ 1 mm and channel width of J-T section ~ 0.1 mm. The applicability of the LTCC technology for microcooling and its performance was investigated numerically using the conjugate heat transport approach. The miniature cryocooler was designed, manufactured and pressure tests on the device were performed in Wroclaw University of Science and Technology.