

## **New Reference Installation for Measurement of Large Thermal Conductivity**

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A reference installation for measurement of materials with thermal conductivity up to 500 W/(m.K) was created in the D.I. Mendeleev Institute for Metrology (VNIIM). It realizes the most accurate stationary comparative method of measurement of thermal conductivity. It uses samples of diameter 30 mm and height 30 mm. The total standard uncertainty is less than 2 %. For reproduction of unit of thermal conductivity for the first time in world practice the multiple-valued measures of thermal conductivity (MVM) are used, developed in VNIIM for measurement of thermal conductivity of thermal insulating materials [1]. Nowadays the reference installation for measurement of thermal conductivity of VNIIM is taking part in international comparisons under the auspices of BIPM. Divergences in measurements of thermal conductivity between NIST (USA), LNE (France), NPL (England) and VNIIM (Russia), after preliminary results of comparisons do not exceed 1 %. The MVM principle involves adjusting the thermal conductivity with the help of a managing signal in such a mode that it becomes equal to thermal conductivity of a researched sample. Thus the maximal accuracy of measurements is reached. The new way of reproduction of unit of thermal conductivity with the help MVM is offered, at which the thermal conductivity without managing influence makes, for example 400 W/(m.K), at submission of a managing signal – 300 W/(m.K), and at change of a direction taking place through MVM of a thermal flow –500 W/(m.K). It allows to graduate MVM on materials with low thermal conductivity and to measure large values of thermal conductivity. The new way of measurement of thermal conductivity is patented.

[1] N.A. Sokolov New reference installation for measurement of thermal conductivity of thermal insulating materials. – In Book of reports abstracts the 16th Symposium on Thermophysical Properties // USA, NIST, Boulder, Colorado, July 30 – August 4, 2006. – P. 254.