

# Cryogenic Technology: Thermal Conductivity of Structural Aluminum Alloys

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## key words

structural alloys, thermal conductivity, measurements, plate (cylinder) method, error, cryostat

A method and a measuring device designed to determine the thermal conductivity of existing structural materials used in superconducting magnets and other cryogenic equipment objects are considered. The results of studies of the temperature dependence of the thermal conductivity of modern structural aluminum alloys ENAW6061 and ENAW6063 in the range from 13 to 82 K.

Obtained values of the thermal conductivity of the alloys differ from the reference data. This is due to changes in technology and the improvement of industrial equipment. The actual values of thermal conductivity obtained by us, despite deviations of 20 %, in turn help to more accurately calculate the cooling time of the product structure in order to increase thermal conductivity and increase cooling efficiency.

We carried out a number of indirect measurements and found that our measuring unit can work with the smallest deviations only at small capacities of temperature regimes. For more powerful temperature conditions, it is necessary to constructively alter the measuring cell.

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