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## Entwicklung einer Messanordnung zur Bestimmung der Wärmeleitfähigkeit



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Determining the thermal conductivity of samples is rather simple these days, as there are several different methods to do so, such as the Laser Flash (LFA) or the hot-wire technique (TCT). Yet, despite their accuracy, these often come at a price, which led this diploma thesis to focus on the development of an apparatus to determine the thermal conductivity by means of a heat flow meter.

In this technique, a sample with known dimensions, is placed between two copper pieces. These are then brought to a specific temperature each by thermocouples to create a temperature difference between the two sides of the sample. Since the current delivered to the thermocouples, which is needed to keep the copper pieces at their temperatures, is proportional to the heat flux generated by these, the thermal conductivity of the sample can be determined.

$$\dot{Q} = \lambda \cdot A \cdot \frac{\Delta T}{s}$$

Additionally, operating instructions have been created to allow the use of this apparatus in laboratories. This way students may be able to gather advanced knowledge about thermal conductivity and its means related to different materials and use-cases.

