

Heat transfer
Heat conduction

Dependence of heat conduction in solid bodies upon material –
Large heat conduction apparatus

Test objective

1. Investigation into the dependence of heat conduction in solid bodies upon material

Setup

Note:

Thermal conductivity λ at 20°C:

Material	Thermal conductivity λ in $\frac{W}{m \cdot K}$
Copper	Approx. 400
Aluminium	Approx. 200
Brass	Approx. 90
Iron	Approx. 50
Glass	Approx. 0.8
Wood	Approx. 0.2

Equipment

1 Apparatus for demonstrating heat conduction .. 389 031
1 Hotplate, 1500 W, 180 mm diam. 666 767

Execution

- Half fill an aluminium pan with water.
- Place the pan uncovered on the hotplate and heat the water to approx. 80°C.
- Switch off hotplate and place cover with test rods on top of the pan. Close the opening for temperature measurement with plug.
- Observe temperature indicators on the test rods.

Observation

Colour changes are to be observed on the metal test rods at periodic intervals.

Sequence: Copper → Aluminium → Brass → Iron.

No colour changes should be observed on the glass and wood test rods.

Evaluation

Heat conductance in solid bodies is dependant on material.

The metals copper, aluminium, brass and iron are good thermal conductors. However, copper conducts heat better than aluminium, brass and iron.

Glass and wood are poor thermal conductors.