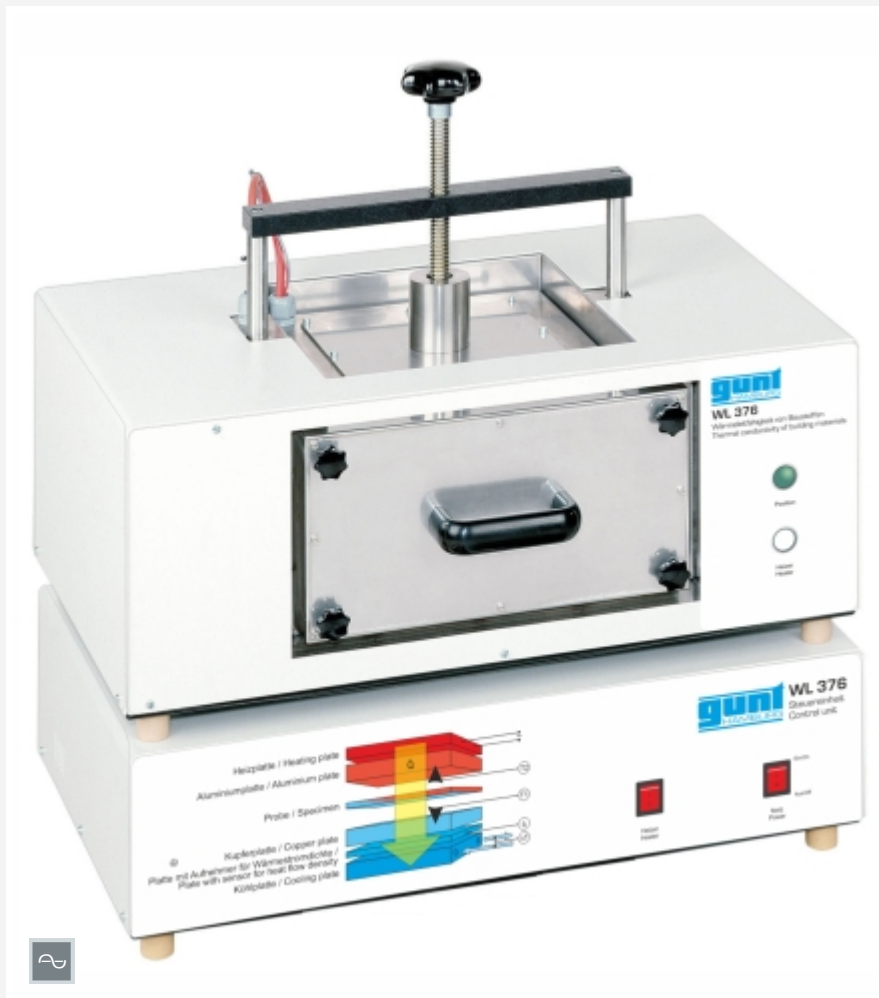


# WL 376

## Thermal conductivity of building materials



### Learning objectives/experiments

- determine the thermal conductivity  $\lambda$  of different materials
- determine the thermal resistance
- thermal conductivity  $\lambda$  for several samples connected in series (up to a thickness of 50mm)

### Description

- **heat conduction in non-metallic building materials**
- **material thicknesses or combinations up to a thickness of 50mm can be used**

Thermal insulation in building planning is a sub-area of construction physics; it uses appropriate measures such as component design to enable a comfortable room climate all year round while at the same time consuming little energy. This is achieved by using building materials with high thermal resistance and low transmission by heat radiation.

The WL 376 device is used to investigate various non-metallic building materials with regard to their thermal conductivity in accordance with DIN 52612. The scope of delivery includes samples made of different materials: insulating panels made of Armaflex, chipboard, PMMA (acrylic glass), styrofoam,

Polystyrene-PS, Polyoxymethylene-POM, cork and plaster. The samples all have the same dimensions and are placed between a heated plate and a water-cooled plate. A clamping device ensures reproducible contact pressure and heat contact.

The hot plate is heated by an electric heating mat. In the cold plate, the temperature is achieved by water cooling. Sensors measure the temperatures at the cooling water inlet and outlet and in the centre of both plates.

The temperatures for the hot plate above the sample and for the cold plate underneath the sample are set using the software provided. A temperature control system ensures constant temperatures.

The heat flux between the hot plate and the cold plate passes through the sample and is measured by a special sensor for heat flux density. The entire housing, including the cover, is thermally insulated to ensure constant ambient conditions.

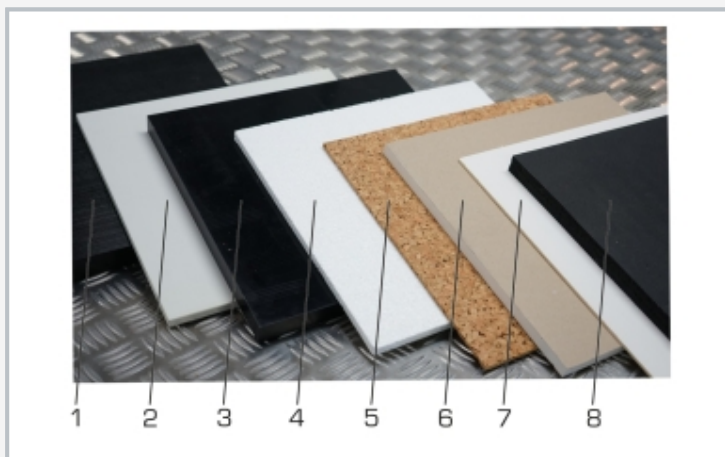
The measured values are transmitted directly to a PC via USB where they can be analysed using the software included.

# WL 376

## Thermal conductivity of building materials



1 insulating housing, 2 cover for sample chamber, 3 control unit, 4 main switch and heater switch, 5 indicator lights, 6 contact spindle



Samples included in the scope of delivery:  
1 Armaflex, 2 PMMA (polymethyl methacrylate), 3 POM (polyoxymethylene), 4 styrofoam, 5 cork, 6 plaster, 7 chipboard, 8 PS (polystyrene)



Software screenshot

### Specification

- [1] determine the thermal conductivity  $\lambda$  in building materials
- [2] thermal conductivity  $\lambda$  and thermal resistance measurement according to DIN 52612
- [3] reproducible contact pressure via clamping device
- [4] 8 samples to be inserted between hot and cold plate
- [5] hot plate with heating mat
- [6] cold plate with water cooling
- [7] software controller for temperature adjustment of cold and hot plate
- [8] 3 temperature sensors for cooling water: at the inlet, outlet and centre of the plate
- [9] 2 temperature sensors for the surface temperature of the hot and cold plate
- [10] sensor for heat flux density
- [11] GUNT software for data acquisition via USB under Windows 10

### Technical data

Electric heating mat

- output: 500W
- max. temperature: 80°C

Samples

- LxW: 300x300mm
- thickness: up to max. 50mm
- material: Armaflex, chipboard, PMMA, styrofoam, PS, POM, cork, plaster

Measuring ranges

- temperature: 3x 0...100°C, 2x 0...200°C
- heat flux density: 0...1533W/m<sup>2</sup>

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 710x440x550mm

LxWxH: 710x440x200mm (control unit)

Total weight: approx. 90kg

### Required for operation

water connection, drain

PC with Windows

### Scope of delivery

- 1 experimental unit
- 1 set of accessories
- 1 GUNT software + USB cable
- 1 set of instructional material

## **WL 376**

### **Thermal conductivity of building materials**

Optional accessories

WL 110.20      Water chiller  
WP 300.09      Laboratory trolley

for Remote Learning

GU 100      Web Access Box  
with  
WL 376W      Web Access Software