WL 376
Thermal conductivity of building materials

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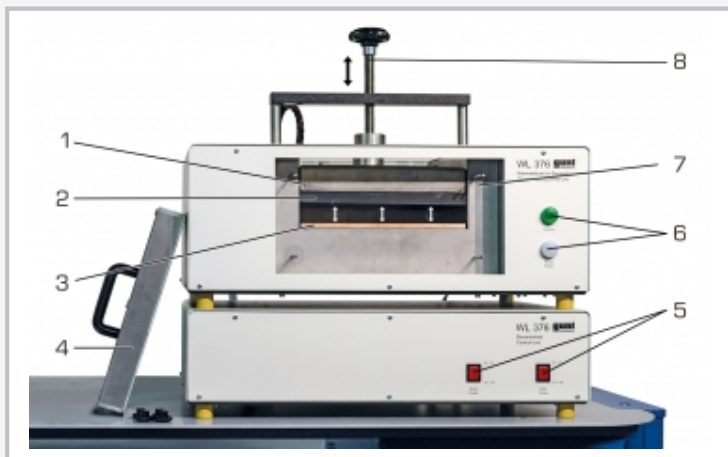
The temperatures for the hot plate above the sample and for the cold plate underneath the sample are set using the software provided. A temperature control system ensures constant temperatures.

The heat flux between the hot plate and the cold plate passes through the sample and is measured by a special heat flux sensor. 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.

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Page 1/3 - 09.2020

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1 hot plate insulation, 2 hot plate, 3 sample, in this case chipboard (cold plate not visible), 4 cover for insulating housing, 5 main switch and heater switch, 6 indicator lights, 7 insulating housing, 8 contact spindle
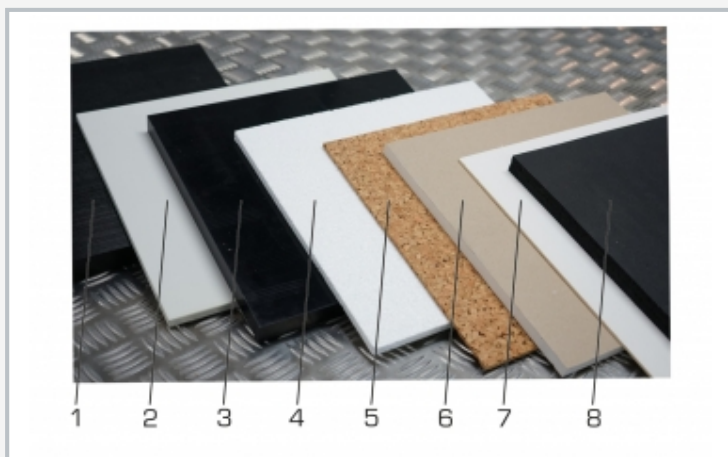
Insulating materials included in the scope of delivery:
1 Armaflex, 2 PMMA (polymethyl methacrylate), 3 POM (polyoxymethylene), 4 styrofoam, 5 cork, 6 plaster, 7 chipboard, 8 PS (polystyrene)
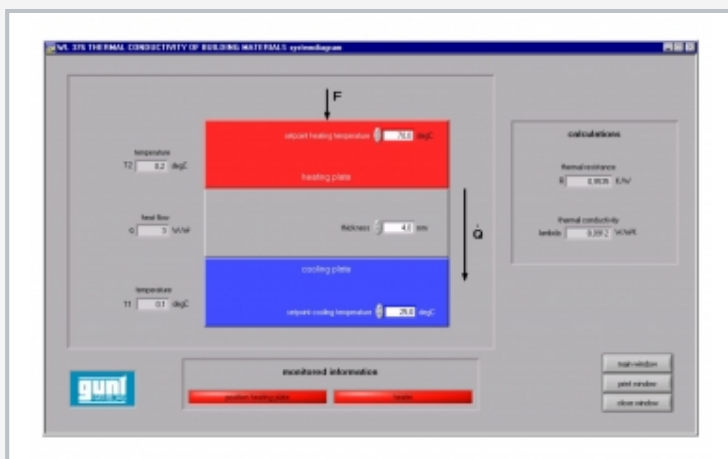
Software screenshot: system diagram

Specification

[1]   determine the thermal conductivity λ in building materials
[2]   thermal conductivity λ 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 and heat flux sensor
[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] GUNT software for data acquisition via USB under Windows 8.1, 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^2

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

Optional accessories

| 020.30009 | WP 300.09 | Laboratory trolley |