Leslie's Cube 1000835

Instruction sheet

09/15 ALF

1. Description

The Leslie's cube is used for investigating heat radiation from a hot body as a function of its temperature, colour and surface characteristics.

Leslie's cube is a hollow aluminium cube with a removable lid for pouring in hot water and 2 openings for inserting a thermometer or thermal sensor and a stirrer. One side each is polished, matt, white and black.

2. Scope of delivery

1 Leslie's Cube

1 Stirrer

2 Rubber stoppers with 6 mm aperture

3. Technical data

Dimensions:	100x100x100 mm³ approx.
Weight:	360 g approx.

4. Operation

To conduct the experiment, the following articles are additionally recommended:

1 Leslie's Cube	1000835
1 Rotating base for Leslie cube	1017875
1 Moll-Type Thermopile	1000824
1 Measurement Amplifier @230 V	1001022
or	
1 Measurement Amplifier @115 V	1001021
1 Digital-Multimeter P3340	1002785
1 Digital Thermometer	1002803
1 NiCr-Ni Immersion Sensor	1002804
1 Pair of Safety Experiment Leads	1002849
1 HF Patch Cord, BNC/4 mm Plug	1002748
2 Barrel Foot, 500 g	1001046
1 Pocket Measuring Tape, 2 m	1002603

- Take off the lid and fill the cube with water or oil (not exceeding approx. 130° C).
- Insert a thermometer for monitoring the temperature and the stirrer into the appropriate apertures. Close the lid again.

- The liquid used to warm the cube from within must be well stirred to achieve an even heat distribution.
- Set up the thermopile approx. 3 to 5 cm away from Leslie's cube.
- Connect the multimeter to the thermopile and set the mode switch to the smallest DC current range. (The current measuring range will produce a larger needle deflection in the comparison to the voltage measuring range).
- After setting up the experiment, wait for a few minutes before taking readings.

Note:

Readings may be made incorrect due to the influence of body heat or other external influences.

- Do not touch the thermopile while taking read-ings.
- Avoid direct sunlight and do not set up the appa-ratus in the vicinity of a heater/radiator.

The black and white lacquered faces emit approximately equal amounts of infrared radiation. The reason for this is that white and black only appear as such within the visible light spectrum. If only the emitted thermal radiation is observed, which has longer wavelengths than visible light, both the white and black faces appear as so-called grey bodies; in other words, both radiate all wavelengths within this range with equal intensity. By contrast, the thermal emission of the metallic faces is much weaker.

Fig 1 Experimental set-up