

Measurement of the thermal conductivity of a glass-epoxy composite at 80K

This article presents the results of the measurements carried out for a glass-epoxy composite at around 80K

I. Measuring devices

The measurements are carried out using a measuring device developed for this type of sample. The measurement is carried out in a steady state by producing a flow of heat through the sample and by measuring the temperature on either side of the sample. The diagram is visible in figure 1. The pyrex makes it possible to measure the flow at the outlet of the sample and to evaluate any lateral losses. Figure 2 shows the device with its clamping system.

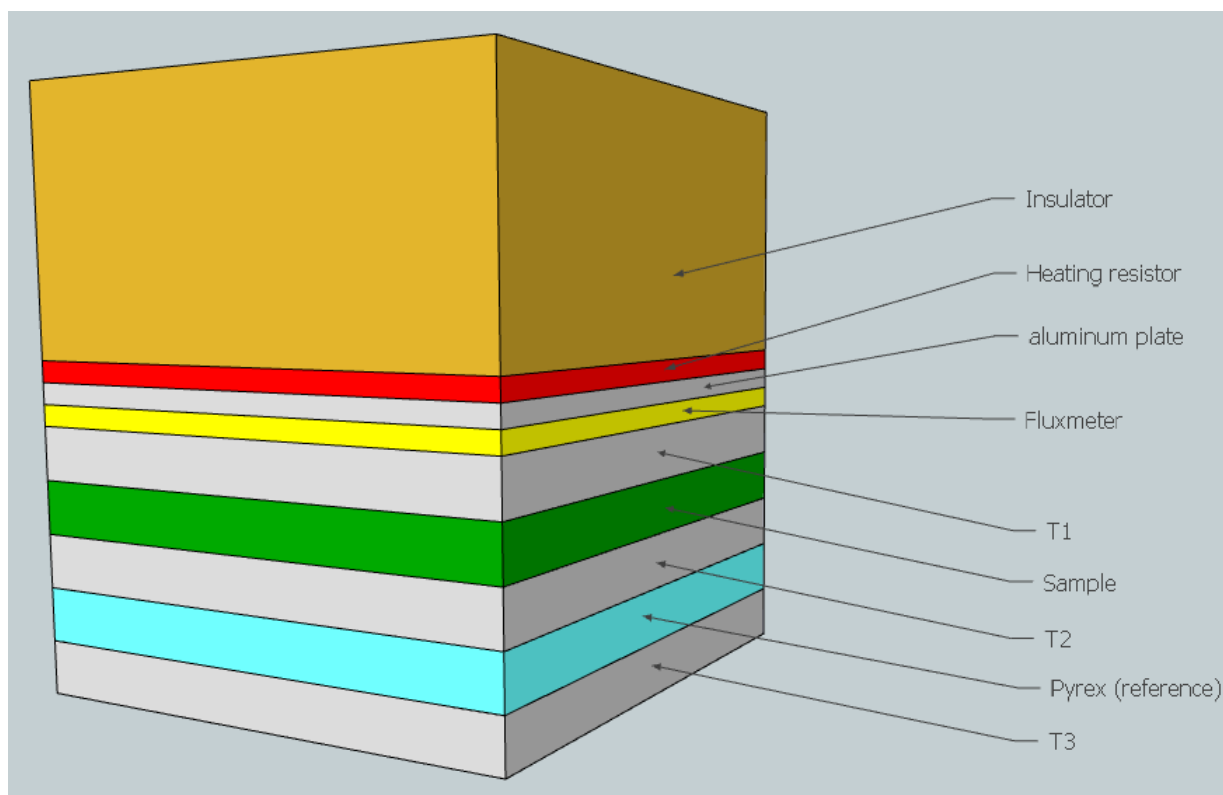
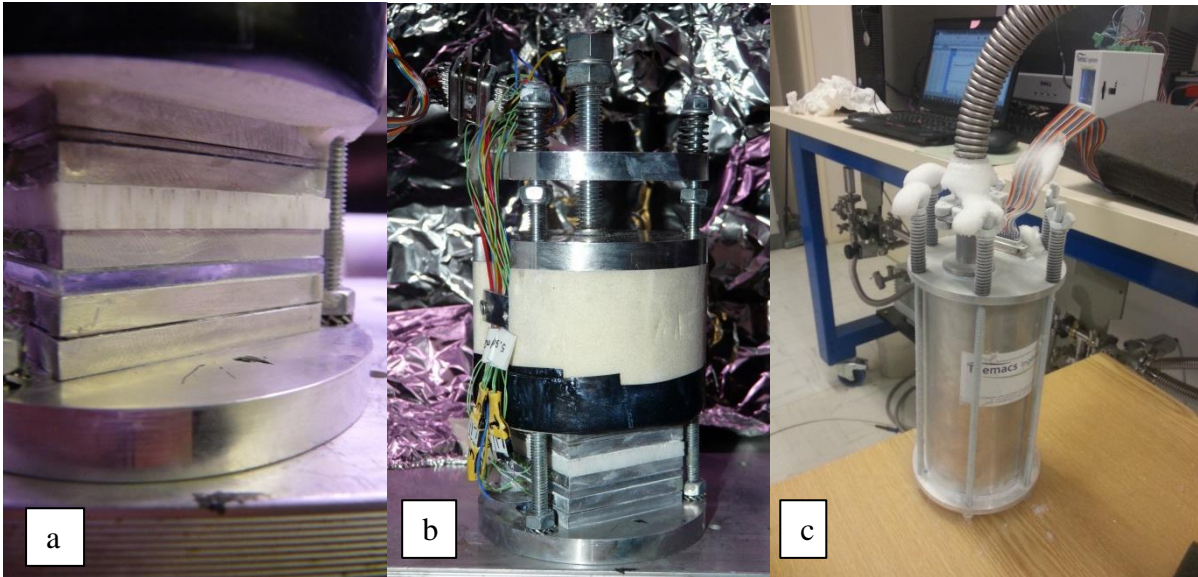


Figure 1: Diagram of the measuring device



*Figure 1: Diagram of the measuring device.
a-stacking of the different elements
b-measuring device with the tightening control system
c-cryostat with vacuum system*

II. Samples:

The sample is a glass-epoxy composite. The measurement was carried out in the two main directions: parallel to the fibers and perpendicular to them. The samples were shaped by milling to allow measurement

III. Presentation of the measurements carried out:

The measurements in the two directions were carried out at slightly different temperatures. They are reported in Table 1. The expanded uncertainties (for a 95% confidence interval) are less than 10% of the measurement.

	Measurement temperature (°C)	Conductivity (W / K / m)
Perpendicular to fibers	-175	0.18
Parallel to fibers	-178.5	0.34

Table 1: conductivity measurements of the glass-epoxy composite