

APPLICATION SHEET

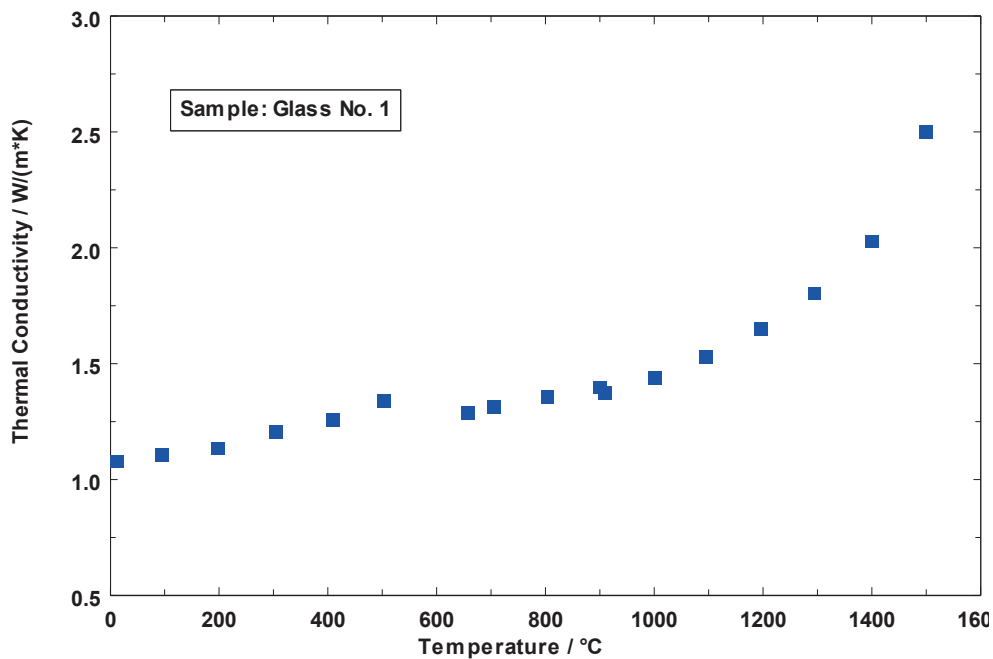
Ceramics · Building Materials
LFA 427

Glass

Introduction

Glass is a uniform amorphous solid material (at ambient temperatures), usually produced when the viscous molten material cools very rapidly to below its glass transition temperature, without sufficient time for a regular crystal lattice to form. The most familiar form of glass is the silica-based material used for windows, containers and decorative

objects. In its pure form, glass is a transparent, strong, hard-wearing, essentially and inert, which can be formed with very smooth and impervious surfaces. Glass is, however, brittle and will break into sharp shards. These properties can be modified or changed with the addition of other compounds or heat treatment. Common glass contains about 70% amorphous silicon dioxide, which is the same chemical compound found in quartz.



Test Conditions

Temperature range: RT ... 1500°C
Atmosphere: Ar at 60 ml/min
Sample holder: Slag
Sensor: DSC, type S

Test Results

The measurement was carried out with a platinum/rhodium slag sample holder. This allows measurements into

the fully liquid region of the glass material. Using this arrangement, the phononic thermal conductivity can be determined. This corresponds to the solid contribution to the heat transfer. It has to be pointed out that the radiative heat transfer is only measured at higher temperatures with this arrangement. Therefore, the thermal conductivity shows a nearly linear increase versus temperature in a wide temperature range. Only in the range of the glass transition (between 500 and 700°C) at very high temperatures, slight deviations to the linear dependence were obtained.