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Plastics — Determination of thermal conductivity and thermal diffusivity —

Part 4: Laser flash method

Plastiques — Détermination de la conductivité thermique et de la diffusivité thermique —

Partie 4: Méthode flash laser

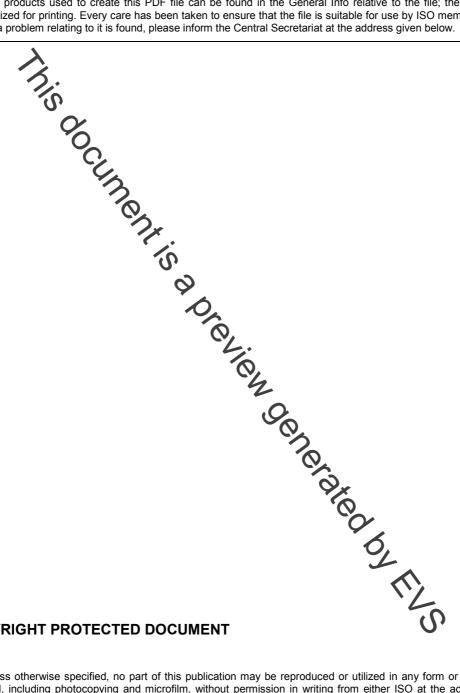


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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in Maison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical control tees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires applying by at least 75 % of the member bodies casting a vote.

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ISO 22007-4 was prepared by Technical Committee ISO/TC 61, Plastics, Subcommittee SC 5, Physicalchemical properties.

ethod Washerday Ochenary S ISO 22007 consists of the following parts, under the general title *Plastics* — *Determination of thermal* conductivity and thermal diffusivity:

- Part 1: General principles
- Part 2: Transient plane heat source (hot disc) method
- Part 3: Temperature wave analysis method
- Part 4: Laser flash method

Plastics — Determination of thermal conductivity and thermal diffusivity —

Part 4:

Laser flash method

1 Scope

- 1.1 This part of ISO 22007 specifies a method for the determination of the thermal diffusivity of a thin solid disc of plastics in the thickness direction by the laser flash method. This method is based upon the measurement of the temperature use at the rear face of the thin-disc specimen produced by a short energy pulse on the front face.
- **1.2** The method can be used for homogeneous solid plastics as well as composites having an isotropic or orthotropic structure. In general, it covers materials having a thermal diffusivity, α , in the range $1 \times 10^{-7} \, \text{m}^2 \cdot \text{s}^{-1} < \alpha < 1 \times 10^{-4} \, \text{m}^2 \cdot \text{s}^{-1}$. Measurements can be carried out in gaseous and vacuum environments over a temperature range from 100 °C to +400 °C.

NOTE For inhomogeneous specimens, the measured values may be specimen thickness dependent.

2 Normative references

The following referenced documents are indispensable or the application of this document. For dated references, only the edition cited applies. For undated document (including any amendments) applies.

ISO 291, Plastics — Standard atmospheres for conditioning and testing

ISO 22007-1, Plastics — Determination of thermal conductivity and thermal diffusivity — Part 1: General principles

ISO/IEC Guide 98-3, Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)

3 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 22007-1 and the following apply.

3.1 pulse width

 t_{p}

time duration for which the laser pulse intensity is larger than half of its maximum value

NOTE It is expressed in seconds (s).