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BSI Standards Publication

Plastics — Determination of thermal conductivity and thermal diffusivity

Part 5: Results of interlaboratory testing of poly(methyl methacrylate) samples (ISO/TR 22007-5:2011)

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Foreword

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Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Symbols and definitions **1**
3 Specimen preparation and characterization **1**
4 Measurement apparatus **2**
5 Measurement procedure **3**
6 Calculations **3**
7 Results and conclusions **3**
8 Results **3**
9 Uncertainty and repeatability **4**
10 Acknowledgment **4**
Annex A (informative) Instructions sent to interlaboratory comparison participants: Procedure for thermal conductivity and diffusivity intercomparison in support of the development of ISO 22007 parts 1-4 ..... **9**
Annex B (informative) Laboratory 1 results **12**
Annex C (informative) Laboratory 2 results **18**
Annex D (informative) Laboratory 3 results **22**
Annex E (informative) Laboratory 4 results **29**
Annex F (informative) Laboratory 5 results **31**
Bibliography **34**

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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 liaison 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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— *Part 1: General principles*

— *Part 2: Transient plane heat source (hot disc) method*

— *Part 3: Temperature wave analysis method*

— *Part 4: Laser flash method*

— *Part 5: Results of interlaboratory testing of poly(methyl methacrylate) samples* [Technical Report]

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Introduction

The purpose of this document is to record the results of the interlaboratory comparison of measurements of the thermal conductivity and thermal diffusivity of poly(methyl methacrylate) PMMA specimens, as a source of information in support of the development of the series of standards on thermal conductivity and diffusivity of plastics, ISO 22007 [1 - 4].

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TECHNICAL REPORT **ISO/TR 22007-5:2011(E)**

Plastics — Determination of thermal conductivity and thermal diffusivity —

Part 5: Results of interlaboratory testing of poly(methyl methacrylate) samples

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1 Scope

This Technical Report presents the results of interlaboratory testing for the determination of thermal conductivity and thermal diffusivity of two poly(methyl methacrylate) (PMMA) materials by means of the transient and the modulated methods presented in ISO 22007 parts 2 to 4 [1 - 4] and additional transient and steady state methods.

The instructions for the intercomparison are presented in Annex A with key items reproduced in the main part of this Technical Report.

The detailed results of individual laboratories are presented in Annexes B to F.

2 Symbols and definitions

Symbol	Meaning	Unit
α	Thermal diffusivity	m^2/s
d	Thickness of specimen	m
λ	Thermal conductivity	W/(m·K)

For definitions of the terms used, the reader is referred to ISO 472 [5] and ISO 22007-1 [1].

3 Specimen preparation and characterization

3.1 Specimens

Two types of PMMA material were used in the intercomparison:

- Sumipex 000 (cast grade), Lot. 6621114, supplied by Sumitomo Chemical Co. Ltd, Japan [6]. Referred to as "Sumipex cast PMMA" herein. Sheet thickness ≈ 2 mm.
- AAJHF (extruded grade), supplied via NPL, UK. Referred to as "extrusion grade PMMA" herein. Sheet thickness ≈ 3 mm.

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