

ISO 22007-3:2008-12 (E)

Plastics - Determination of thermal conductivity and thermal diffusivity - Part 3: Temperature wave analysis method

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols and units	2
5	Principle	2
6	Apparatus	2
6.1	General	2
6.2	Constant-temperature enclosure	3
6.3	Heater and sensor elements	3
6.4	Heating circuit	5
6.5	Measurement circuit	5
6.6	Phase-shift measurement device	5
6.7	Devices for measuring the specimen temperature	5
7	Test specimen	6
7.1	Dimensions	6
7.2	Thickness	6
7.3	Specimen-backing plates	6
8	Procedure	6
9	Analysis of results	7
10	Calibration and verification of apparatus and method	8
10.1	Calibration	8
10.2	Verification	8
11	Precision and bias	9
11.1	Uncertainty	9
11.2	Repeatability	9
12	Test report	9
Annex A (informative) Mathematical background to temperature wave analysis		10
Annex B (informative) Typical thermal-diffusivity data for a typical polyimide		11
Annex C (informative) Example of frequency-thickness relationships required for acceptable measurements		12
Annex D (informative) Numerical simulations of the phase shift, ϕ , as a function of kd and α		14
Annex E (informative) Examples of uncertainties in thermal-diffusivity measurements		15
Bibliography		16