

ISO 5659:2026-01 (E)

Plastics - Smoke generation - Determination of optical density by a single-chamber test

Contents

	Page
Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Principles of the test.....	3
5 Suitability of a material or product for testing.....	3
5.1 Material or product geometry.....	3
5.2 Surface characteristics.....	3
5.3 Asymmetrical products.....	3
6 Specimen construction and preparation.....	4
6.1 Number of specimens.....	4
6.2 Size of specimens.....	4
6.3 Specimen preparation.....	4
6.4 Conditioning.....	5
6.5 Wrapping of specimens.....	5
6.6 Dimensionally unstable materials.....	5
7 Apparatus and ancillary equipment.....	6
7.1 General.....	6
7.2 Test chamber.....	6
7.2.1 Construction.....	6
7.2.2 Chamber pressure control facilities.....	7
7.2.3 Chamber wall temperature.....	10
7.3 Specimen support and heating arrangements.....	11
7.3.1 Radiator cone.....	11
7.3.2 Framework for support of the radiator cone, specimen holder and heat flux meter.....	11
7.3.3 Radiation shield.....	14
7.3.4 Heat flux meter.....	14
7.3.5 Specimen holder.....	14
7.3.6 Pilot burner.....	15
7.4 Gas supply.....	15
7.5 Photometric system.....	16
7.5.1 General.....	16
7.5.2 Light source.....	16
7.5.3 Photo detector.....	16
7.5.4 Additional equipment.....	18
7.6 Chamber leakage.....	18
7.7 Cleaning materials.....	19
7.8 Ancillary equipment.....	19
7.8.1 Balance (optional).....	19
7.8.2 Timing device.....	19
7.8.3 Linear measuring devices.....	19
7.8.4 Auxiliary heater.....	19
7.8.5 Protective equipment.....	19
7.8.6 Recorder.....	19
7.8.7 Water-circulating device.....	19
7.8.8 Oxygen meter (optional).....	19

8	Test environment	20
9	Setting-up and calibration procedures	20
	9.1 General.....	20
	9.2 Alignment of photometric system.....	20
	9.2.1 General.....	20
	9.2.2 Beam collimation.....	20
	9.2.3 Beam focusing.....	20
	9.3 Selection of compensating filter(s).....	21
	9.4 Linearity check.....	21
	9.5 Calibration of range-extension filter.....	21
	9.6 Chamber leakage rate test.....	22
	9.7 Burner calibration.....	22
	9.8 Radiator cone calibration.....	22
	9.9 Cleaning.....	23
	9.10 Frequency of checking and calibrating procedure.....	23
10	Test procedure	24
	10.1 General.....	24
	10.2 Preparation of test chamber.....	24
	10.3 Tests with pilot flame.....	24
	10.4 Preparation of the photometric system.....	24
	10.5 Loading the specimen.....	25
	10.6 Recording of light transmission.....	25
	10.7 Observations.....	25
	10.8 Termination of test.....	25
	10.9 Testing in different modes.....	26
11	Expression of results	26
	11.1 Specific optical density, D_s	26
	11.2 Clear-beam correction factor, D_c	27
12	Precision	27
13	Test report	27
	Annex A (normative) Calibration of heat flux meter	29
	Annex B (informative) Variability in the specific optical density of smoke measured in the single-chamber test	30
	Annex C (informative) Determination of mass optical density	32
	Annex D (informative) Precision data from tests on intumescent materials	37
	Annex E (informative) Guidance on optical density testing	39
	Annex F (informative) Specific sample preparation	46
	Annex G (informative) Background to standard reference materials	49
	Bibliography	50