BRITISH STANDARD

BS EN
12099 : 1997
BS 2782 :
Part 11 :
Method 1103E :
1997

Plastics piping systems — Polyethylene piping materials and components — Determination of volatile content

The European Standard EN 12099 : 1997 has the status of a British Standard

ICS 23.040.20; 23.040.45;

National foreword

This British Standard is the English language version of EN 12099 : 1997 published by the European Committee for Standardization (CEN).

The UK participation in its preparation was entrusted to Technical Committee PRI/61, Plastics piping systems and components, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

This European Standard is also incorporated into BS 2782 *Methods of testing plastics* : Part 11 *Thermoplastics pipes, fitting and valves*, as Method 1103E : 1997, for association with related test methods for plastics materials and plastics piping systems.

It is also for use for the revision or amendment of other national standards as practicable, but it should not be presumed to apply to any existing standard or specification which contains or makes reference to a different test method until that standard/specification has been amended or revised to make reference to this method and any requirements adjusted as appropriate.

NOTE : Subclause **4.1** states that test pieces may be cut from a cross-section of a pipe or fitting. For a test method for determining the content of volatile material, it is essential that the cutting technique does not heat the test piece to an extent that would expel any material and thereby affect the results. In the absence of any related instructions by a referring standard, the responsible BSI committee considers that the cutting method should not induce any tangible heating or involve any coolant which could be adsorbed.

Warning note. This British Standard, which is identical with EN 12099 : 1997, does not necessarily detail all the precautions necessary to meet the requirements of the Health and Safety at Work etc. Act 1974. Attention should be paid to any appropriate safety precautions and the method should be operated only by trained personnel.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 4, an inside back cover and a back cover.

This British Standard, having been prepared under the direction of the Sector Board for Materials and Chemicals, was published under the authority of the Standards Board and comes into effect on 15 December 1997

ISBN 0 580 28748 3

Amendments issued since publication

Amd. No.	Date	Text affected

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12099

May 1997

ICS

Descriptors: Fluid pipelines, plastics tubes, polyethylene, chemical analysis, determination of content, volatile matter

English version

Plastics piping systems — Polyethylene piping materials and components — Determination of volatile content

Systèmes de canalisations en plastiques — Matériaux et composants de tuyauterie en polyéthylène — Détermination de la teneur en matières volatiles

Kunststoff-Rohrleitungssysteme — Polyethylen-Rohrleitungswerkstoffe und — teile — Bestimmung des Gehalts an flüchtigen Bestandteilen

This European Standard was approved by CEN on 1997-03-28. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Ref. No. EN 12099 : 1997 E

Foreword

This European standard has been prepared by Technical Committee CEN/TC 155, Plastics piping systems and ducting systems, the secretariat of which is held by NNI.

The material-dependent parameters and/or performance requirements are incorporated in the System Standard(s) concerned.

This standard is one of a series of standards on test methods which support System Standards for plastics piping systems and ducting systems.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 1997, and conflicting national standards shall be withdrawn at the latest by November 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies a method for determining the content of material volatile at 105 °C in polyethylene (PE) piping materials.

This method is applicable to moulding and extrusion materials. It can also be applicable to components in PE piping systems.

2 Principle

The method consists of determining the loss of mass of a test piece which has been put in a drying oven at a given temperature.

NOTE. It is assumed that the following test parameters are set by the standard making reference to this standard:

a) the source and form of the test piece (see **4.1**);

b) number of test pieces (see **4.2**).

3 Apparatus

3.1 *Drying oven or equivalent device*, capable of maintaining the temperature at (105 ± 2) °C at the position for the cup(s) (see **3.2** and **5.4**).

3.2 *A cylindrical glass weighing cup*, with a diameter of 35 mm capable of containing a test piece (see **4.1**), a minimum volume of 50 ml and a corresponding lid.

3.3 *A desiccator.*

3.4 *An analytical balance or equivalent*, capable of weighing to the nearest 0,1 mg.

4 Test piece

4.1 Each test piece shall comprise an approximately 25 g portion of a sample representative of the material before moulding or extrusion, as applicable, or cut in accordance with the referring standard from a cross section of a pipe or fitting.

NOTE. If test samples utilize different sampling weights or are taken from different sources, e.g. raw material granulate or finished product, then there may be a difference in test results obtained. This may depend on e.g. the surface area/mass ratio or the maximum thickness of material. To demonstrate correlation with results for granulate samples determined in accordance with this standard, the preparation of samples from finished product may have to be modified.

4.2 The number of test pieces shall be as specified in the referring standard.

5 Procedure

5.1 Clean and dry a weighing cup and its lid (**3.2**) until constant weight is achieved and store them in the desiccator (**3.3**) for at least 0,5 h at room temperature.

5.2 Take the weighing cup and its lid out of the desiccator and determine their combined mass, m_0, to the nearest 0,1 mg. Replace the lid in the desiccator.

5.3 Fill the cup with about 25 g portion of the sample and determine the mass, m_1 of the cup, lid and the test portion to the nearest 0,1 mg.

5.4 Put the weighing cup in the drying oven zone which is kept at (105 ± 2) °C (see **3.1**).

5.5 After a period of (65 ± 5) min, take the weighing cup out of the drying oven and put the cup in the desiccator for at least 1 h at room temperature.

5.6 Cover the cup with the lid. Weigh the cup, lid and residual material to the nearest 0,1 mg, as mass m_2.

6 Calculation

Calculate the volatile material content, m_v, of the test portion using the following equation:

$$m_v = \frac{m_1 - m_2}{m_1 - m_0} \times 10^6$$

where:

m_v is the volatile material content in milligrams per kilogram (mg/kg) at (105 ± 2) °C;

m_0 is the mass in grams of the empty weighing cup and its lid;

m_1 is the mass in grams of the weighing cup and its lid plus the test portion;

m_2 is the mass in grams of the weighing cup and its lid plus the residual material after 1 h at (105 ± 2) °C.

7 Test report

The test report shall include the following information:

a) the reference to this standard and to the referring standard;

b) the complete identification of the test piece;

c) the source and form of the material;

d) the test temperature;

e) the number of test portions tested;

f) the calculated volatile material content, in milligrams per kilogram (mg/kg) for each test portion;

g) any factors which may have affected the results, such as any incidents or any operating details not specified in this standard;

h) the date of the test.

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