BRITISH STANDARD

BS EN 1705 : 1997
BS 2782 : Part 11 : Method 1133C : 1997

# Plastics piping systems — Thermoplastics valves — Test method for the integrity of a valve after an external blow

The European Standard EN 1705 : 1996 has the status of a British Standard

ICS 23.060.20

# Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PRI/61, Plastics piping systems and components, upon which the following bodies were represented:

British Gas plc
British Plastics Federation
British Plumbing Fittings Manufacturers' Association
British Valve and Actuator Manufacturers' Association
Chartered Institution of Water and Environmental Management
Department of the Environment (British Board of Agrèment)
Department of the Environment (Building Research Establishment)
Department of Transport
Electricity Association
Health and Safety Executive
Institutute of Building Control
Institute of Materials
Institution of Civil Engineers
Institution of Gas Engineers
National Association of Plumbing, Heating and Mechanical Service Contractors
Pipeline Industries Guild
Plastics Land Drainage Manufacturers' Association
Society of British Gas Industries
Society of British Water Industries
Water Companies Association
Water Services Association of England and Wales

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

ERA Technology Ltd.
Engineering Equipment and Materials Users' Association
RAPRA Technology Ltd.

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 May 1997



**Amendments issued since publication**

| Amd. No. | Date | Text affected |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

The following BSI references relate to the work on this standard:
Committee reference PRI/61
Draft for comment 95/121250 DC

**ISBN 0 580 27180 3**

# Contents

# National foreword

This British Standard has been prepared by Technical Committee PRI/61 and is the English language version of EN 1705 : 1996 *Plastics piping systems — Thermoplastics valves — Test method for the integrity of a valve after an external blow*, published by the European Committee for Standardization (CEN).

It is incorporated into BS 2782 *Methods of testing plastics : Part 11 : Thermoplastics pipes, fittings and valves*, as Method 1133C : 1997, for association with related test methods for plastics materials and plastics piping components.

This test method has been prepared for reference by other standards under preparation by CEN for specification of plastics piping and ducting systems and components. It has been implemented to enable experience of the method to be gained and for use for other fresh applications.

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 adjust any requirements as appropriate.

### Cross-references

| Publication referred to | Corresponding British Standard |
|---|---|
| EN 744 : 1995 | BS EN 744 : 1996 *Plastics piping and ducting systems — Thermoplastics pipes — Test method for resistance to external blows by the round-the-clock method* (BS 2782 : Part 11 : Method 1108C : 1996) |
| EN 28233 | BS EN 28233 : 1992 *Thermoplastics valves — Torque — Test method* (BS 2782 : Part 11 Method 1131 : 1992) |

NOTE 1. In the descriptors, the term 'driving squares' is irrelevant: it appears to be a mistranslation of a French descriptor for 'closing torque'. The term 'cocks' should be read as 'valves'.

NOTE 2. For consistency, the term 'closing torque' used, only , in **6.5** should be read as 'stop torque' as used in **6.3** and in item b) in the note to clause **3**.

**Warning note**. This British Standard, which is identical with EN 1705 : 1996, 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.

In particular, it is the opinion of UK Technical Committee PRI/61 that the method as written gives test conditions known to be appropriate and required for some applications, including polyethylene valves for gas distribution. For testing of valves of more brittle materials and/or intended for other applications, the test conditions may be inappropriate, e.g. conditioning to −20 °C as required for **6.1.3** and **6.1.4**, The Technical Committee therefore draws particular attention to clause **3** and the note thereto, including item c), and to the notes which follow **6.1.5** and **6.6.**

**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, pages i and ii, the EN title page, pages 2 to 4, an inside back cover and a back cover.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

# EN 1705

November 1996

ICS 23.060.00

Descriptors: Plastic tubes, cocks, thermoplastic resins, driving squares, tests, impact tests, verification, torque

English version

# Plastics piping systems — Thermoplastics valves — Test method for the integrity of a valve after an external blow

Systèmes de canalisations en plastique — Robinets thermoplastiques — Méthode d'essai pour la vérification d'un robinet après un choc externe

Kunststoff-Rohrleitungssysteme — Thermoplast-Armaturen — Prüfverfahren der Unversehrheit einer Armatur nach äußerer Schlagbelastung



**CEN**

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

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

## 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 May 1997, and conflicting national standards shall be withdrawn at the latest by May 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, 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 leaktightness and the ease of operation of a valve following an impact applied to the operating mechanism (cap) or other exposed mechanism.

## 2 Normative references

This standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of, any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

| | |
|---|---|
| EN 744 : 1995 | *Plastics piping and ducting systems - Thermoplastics pipes - Test method for resistance to external blows by the round-the clock method* |
| EN 28233 | *Thermoplastics valves - Torque - Test method* |

## 3 Principle

The operating cap or other exposed mechanism of an assembled valve is struck once by a falling weight under specific conditions onto its most critical position, i.e. the position on a valve of any given design most likely to impair its performance (see **6.1.4**). The valve is then tested for any effects on its operating torque, strength of the stop mechanism and leaktightness.

Unless otherwise specified in the referring standard, the test temperatures are −20°C and +40°C.

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

a) the impact test parameters, including;
- the mass of the falling weight (see **4.2**);
- the geometry of the striker (see **4.2**);
- the height of the fall of the striker (see **6.1**);

b) maximum stop torque (see **6.3** and **6.5**);

c) if applicable, the test temperature(s) (see clause **3**).

## 4 Apparatus

**4.1** *A clamping fixture*, with a means of clamping the valve at both outlets to a base which is rigid and moveable.

**4.2** *A falling weight testing machine*, conforming to EN 744, with the testing parameters as specified by the referring standard.

**4.3** *A device*, for measuring the operating torque of the valve and the strength of the stop mechanisms.

**4.4** *A temperature-controlled environment*, maintained at $(-20 \pm 2)$ °C.

**4.5** *A temperature-controlled environment*, maintained at $(40 \pm 2)$ °C.

**4.6** *A temperature-controlled water bath*, maintained at $(20 \pm 2)$ °C.

**4.7** *Other equipment*, as follows:

a) a compressed air supply capable of maintaining the specified pressure (see **6.6**);

b) a pressure measurement device, capable of checking conformity to the specified pressure (see **6.6**);

c) a temperature measurement device(s) capable of checking conformity to the temperatures specified in **4.4, 4.5, 4.6, 6.1, 6.2, 6.4** and **6.6**;

d) end-closures connected to the ends of the valve, allowing, by means of an appropriate system, sealing and connecting to the pressurizing equipment.

## 5 Test piece

The test piece shall comprise a valve, in the as-manufactured condition, complete with operating cap or other mechanism and end-closures (see **4.7**).

## 6 Procedure

### 6.1 General

**6.1.1** Measure and record the opening and closing torques of the valve in accordance with EN 28233.

**6.1.2** Mount the valve in the clamping fixture (**4.1**) so that when tested in accordance with **6.1.4** the striker will impact upon the position on the valve mechanism most likely to impair its performance.

Set the falling weight testing machine so that the height of fall of the striker to the point of contact with the valve mechanism (see **6.1.4**) will be as specified (see note to clause **3**).

**6.1.3** Place the valve and fixture assembly in the temperature-controlled environment and condition it at $(-20 \pm 2)$ °C for a minimum of 2 h.

**6.1.4** Remove the valve and fixture assembly from the temperature-controlled environment. Within 30 s position the assembly in the testing machine and release the falling weight so that the striker falls onto the applicable point of the valve operating mechanism (see **6.1.2**).

**6.1.5** Inspect the test piece visually for and record the details of the position and appearance of any evidence of cracking after impact.

NOTE. Attention is drawn to the need to contain the possible effects of failure of components subjected to impact testing or destructive testing.

### 6.2 Assessment of operating torque at −20 °C

Following the impact test recondition the valve at $(-20 \pm 2)$ °C for a minimum of 2 h.

Measure and record the opening and closing torques in accordance with EN 28233.

### 6.3 Assessment of the resistance of the stop mechanism at −20 °C

Immediately following testing in accordance with **6.2**, apply the maximum stop torque, as specified by the referring standard, to the valve in the open and closed positions.

Record any evidence of damage and/or malfunction.

### 6.4 Assessment of operating torque at 40 °C

Following testing in accordance with **6.2** and **6.3**, recondition the valve at $(40 \pm 2)$ °C for a minimum of 24 h.

Measure and record the opening and closing torque in accordance with EN 28233.

### 6.5 Assessment of the resistance of the stop mechanism at 40 °C

Immediately following testing in accordance with **6.4**, apply the maximum closing torque, as specified by the referring standard, to the valve in the open and closed positions.

Record any evidence of damage and/or malfunction.

### 6.6 Assessment of external leaktightness

Following testing in accordance with **6.5**, connect the valve to the pneumatic pressure source [see item a) of **4.7**] and condition it in a water bath at $(20 \pm 2)$ °C for a minimum of 12 h.

With the valve in the half-open position pressurize the valve pneumatically to at least 6 bar. Maintain this pressure for at least 1 h while monitoring it for, and recording, any signs of external leakage.

NOTE. Attention is drawn to the need to contain the possible effects of failure of components subjected to impact testing or destructive testing.

## 7 Test report

The test report shall include the following information:

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

b) a full identification of the product, including manufacturer and production date;

c) the test temperatures;

d) the values of opening and closing torques measured prior to impact (see **6.1**), and following impact at both −20 °C and 40 °C (see **6.2** and **6.4**), and a description of any visible evidence of cracking after impact (see **6.1**);

e) the torque applied to the operating stop mechanisms and any signs of consequent damage or malfunction;

f) the results of the leaktightness test (see **6.6**);

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 test.

# List of references

See national foreword.

# BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

**Revisions**

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

**Buying standards**

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

**Information on standards**

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

**Copyright**



BSI
389 Chiswick High Road
London
W4 4AL