BRITISH STANDARD

BS EN
1074-3:2000

Valves for water supply — Fitness for purpose requirements and appropriate verification tests —

Part 3: Check valves

The European Standard EN 1074-3:2000 has the status of a British Standard

ICS 23.060.50; 91.140.60

National foreword

This British Standard is the official English language version of EN 1074-3:2000.

The UK participation in its preparation was entrusted by Technical Committee PSE/7, Valves, to Subcommittee PSE/7/7, Valves for the water industry, 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 subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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 9 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 July 2000

ISBN 0 580 35957 3

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

EN 1074-3

April 2000

ICS 23.060.50

English version

Valves for water supply – Fitness for purpose requirements and appropriate verification tests – Part 3: Check valves

Robinetterie pour l'alimentation en eau – Prescriptions d'aptitude à l'emploi et vérifications s'y rapportant – Partie 3: Clapets de non retour

Armaturen für die Wasserversorgung – Anforderungen an die Gebrauchstauglichkeit und deren Prüfung – Teil 3: Rückflußverhinderer

This European Standard was approved by CEN on 26 November 1999.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

Ref. No. EN 1074-3:2000 E

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 69, Industrial valves, the Secretariat of which is held by AFNOR.

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 October 2000, and conflicting national standards shall be withdrawn at the latest by October 2000.

It consists of six parts:

Part 1: General requirements

Part 2: Isolating valves

Part 3: Check valves

Part 4: Air valves

Part 5: Control valves

Part 6: Hydrants.

Part 1, in conjunction with the subsequent parts, lays down the general requirements and test procedures to be carried out in production and during the assessment of conformity of these valves (type tests). The detailed requirements, which depend on the types of valves, are defined in parts 2 to 6 of this standard.

Annex A of this European standard is normative.

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.

Introduction

In respect of potential adverse effects on the quality of water intended for human consumption caused by the product covered by this standard:

1) This standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA.

2) It should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

1 Scope

This European Standard defines the minimum fitness for purpose requirements for check valves to be used in, or connected to, water supply pipe systems, above or below ground (see EN 805), carrying water intended for human consumption.

This standard specifies the design requirements, the performance requirements, and the conformity assessment method for check valves, whatever their type and materials.

This standard applies in priority to any other product or test standard: the requirements from other standards apply only when this standard refers to them.

This standard deals with the requirements applicable to check valves up to DN 2 000 and PFA 6 bar to PFA 25 bar. It does not apply to anti-pollution check valves which are covered by other standards.

2 Normative references

This European Standard incorporates, by dated or undated references, 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 European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 736-1, *Valves - Terminology - Part 1: Definition of the types of valves.*

EN 1074-1, *Valves for water supply - Fitness for purpose requirements and appropriate verification tests - Part 1 : General requirements.*

EN 1267, *Valves - Test of flow resistance using water as test fluid.*

EN 805, *Water supply - Requirements for systems and components outside buildings.*

3 Definitions

For the purpose of this standard, the definitions of EN 1074-1 apply together with the following definitions:

3.1 check valve: Valve which automatically opens by fluid flow in a defined direction and which automatically closes to prevent fluid flow in the reverse direction (EN 736-1).

4 Design requirements

Check valves shall be designed in accordance with the requirements given in clause 4 of EN 1074-1.

Check valves can be equipped with a device to assist closure or balance the weight of the obturator; however, such valves are not considered to have a mechanically operated obturator.

The manufacturer shall indicate in the relevant technical documentation the orientations in which the check valves fulfil the requirements of this standard.

5 Performance requirements

5.1 Mechanical strength

5.1.1 Resistance to internal pressure of the shell and of all pressure containing components

Requirement and test shall be in accordance with 5.1.1 of EN 1074-1.

5.1.2 Resistance of the obturator to differential pressure

Requirement and test shall be in accordance with 5.1.2 of EN 1074-1.

The test shall be performed with the pressure applied to the downstream side of the obturator.

After the test, the obturator shall not be jammed nor wedged. After completing the test, the operating torque shall not exceed the initial operating torque by more than 10 %.

5.1.3 Resistance of valves to bending

Bending resistance is an optional requirement for check valves; if bending resistance is claimed by the manufacturer, the requirement and test shall be in accordance with 5.1.3 of EN 1074-1, for sizes DN 50 up to and including DN 500.

The test shall be performed with the pressure applied to the downstream side of the obturator. The bending moments *M* to be applied during the test shall be as given in table 1 as a function of DN, or shall be given by the manufacturer's technical documentation.

Table 1 - Bending moments

DN	*M* Nm
50	1 050
65	1 400
80	1 500
100	2 200
125	3 200
150	4 800
200	7 200
250	11 000
300	15 000
350	19 000
400	24 000
450	28 000
500	33 000

5.2 Leak-tightness

5.2.1 Leak-tightness of the shell and all pressure containing components

5.2.1.1 Leak-tightness to internal pressure

Requirement and test shall be in accordance with 5.2.1.1 of EN 1074-1.

5.2.1.2 Leak-tightness to external pressure

Requirement and test shall be in accordance with 5.2.1.2 of EN 1074-1.

5.2.2 Seat tightness

5.2.2.1 Seat tightness at high differential pressure

Requirement and test shall be in accordance with 5.2.2.1 of EN 1074-1. For a type test, the test duration shall be not less than 10 min.

The test shall be performed with the pressure applied to the downstream side of the obturator.

5.2.2.2 Seat tightness at low differential pressure

Requirement and test shall be in accordance with 5.2.2.2 of EN 1074-1, with the test duration given in 5.2.2.1.

The test shall be performed with the pressure applied to the downstream side of the obturator.

5.3 Hydraulic characteristics

Requirement shall be in accordance with 5.3 of EN 1074-1; the characteristic given by the manufacturer shall be the head loss as a function of flow.

When measured with a test installation in accordance with clause 4 of EN 1267, the head loss shall be not more than 1,1 times the value indicated by the manufacturer. Testing is not required for check valves greater than DN 300.

5.4 Resistance to disinfection products

Requirement and test shall be in accordance with 5.4 of EN 1074-1.

5.5 Endurance

Check valves shall keep their functional capacity after a significant number of operations (opening/closing cycles).

When, in order to verify this requirement, a check valve has been subjected to a test in accordance with annex A, comprising 2 500 opening/closing cycles, it shall still pass the leak-tightness tests in accordance with 5.2.1 and 5.2.2 and no breakage of any part shall be detected by visual inspection after dismantling the valve. Testing is not required for check valves greater than DN 300.

6 Conformity assessment

6.1 General

Requirement shall be in accordance with 6.1 of EN 1074-1.

6.2 Type tests

Requirement shall be in accordance with 6.2 of EN 1074-1; the type tests to be performed shall be those given in table 2. They shall take place with the valve in the horizontal position, or in the position indicated by the manufacturer depending on the possibilities of use of the check valve.

6.3 Control of production process and quality system

Requirement shall be in accordance with 6.3 of EN 1074-1; the production control tests in table 2 are informative.

7 Marking

Requirement shall be in accordance with clause 7 of EN 1074-1. In addition, the direction of flow shall be marked.

8 Packaging

Requirement shall be in accordance with clause 8 of EN 1074-1.

Table 2 - Requirements and tests

Sub-clause [a]	Requirement [a]	Type tests	Production tests (informative)
4.1	Materials	see drawings and part lists	-
4.2	DN	see drawings	-
4.3	Pressures	see technical documentation	-
4.4	Temperatures	see Materials	-
4.5	Design of the shell and obturator	see test report or calculation report	-
4.6	End types and interchangeability	see drawings and marking	-
4.7	Operating direction	see drawings	-
4.8	Maximum water velocity	see clause 4	-
4.9	All materials, including lubricants, in contact with water intended for human consumption	see test reports in accordance with national regulations	-
4.10	Internal corrosion and ageing resistance	see drawings, part lists and technical documentation	visual inspection of coatings
4.11	External corrosion and ageing resistance	see drawings, part lists and technical documentation	visual inspection of coatings
5.1.1	Resistance to internal pressure of the shell and of all pressure containing components	see 5.1.1	see 5.1.1
5.1.2	Resistance of the obturator to differential pressure	see 5.1.2	-
5.1.3	Resistance of valves to bending	see 5.1.3	-
5.2.1.1	Leak-tightness to internal pressure	see 5.2.1.1	see 5.2.1.1
5.2.1.2	Leak-tightness to external pressure	see 5.2.1.2	-
5.2.2.1	Seat tightness at high differential pressure	see 5.2.2.1	see 5.2.2.1
5.2.2.2	Seat tightness at low differential pressure	see 5.2.2.2	-
5.3	Hydraulic or airflow characteristics	see 5.3	-
5.4	Resistance to disinfection products	see 5.4	-
5.5	Endurance	see 5.5	-

[a] The sub-clauses and requirements shown above, are those given in EN 1074-1

Annex A
(normative)

Test method for the endurance of check valves (see 5.5)

A.1 General

The test shall be performed with water at ambient temperature, on a check valve in its delivery state. The test assembly shall be able to establish in sequence a water flow situation through the valve with a minimum velocity of 1 m/s and a no flow situation with a downstream pressure equal to PMA.

A.2 Test procedure

Place the check valve in the test assembly in the horizontal position, or in the position indicated by the manufacturer depending on the possibilities of use of the valve.

Establish a water flow through the valve and maintain the flow for a time sufficient to reach a minimum velocity of 1m/s.

Stop the flow, decrease the upstream pressure and raise the downstream pressure (thus closing the obturator) until the differential pressure on the obturator reaches PMA ±10 %. Maintain closed at this pressure for a minimum of 30 s.

Release the downstream pressure and begin a new cycle by re-establishing a water flow. Repeat the procedure for 2 500 cycles.

Remove the valve from the test assembly and perform the leak-tightness tests in accordance with 5.2.1 and 5.2.2.

After termination of all tests, dismantle the valve and check by visual inspection the absence of breakage of any part.

Terminate the test, record the test conditions and test results, noting the calibration status of all measuring devices.

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