ASME A112.14.1-2003
(Revision of ANSI A112.14.1M-1975)

BACKWATER VALVES

AN AMERICAN NATIONAL STANDARD

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The next edition of this Standard is scheduled for publication in 2008. There will be no addenda issued to this edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the ASME Web site under the Committee Pages at http://www.asme.org/codes/ as they are issued.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

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FOREWORD

The American National Standards Committee A112, Plumbing Materials and Equipment, was established on July 27, 1955. Its first organizational meeting was held on July 22, 1958, and Panel No. 14 was created on May 1, 1964, to establish standards for interceptors, separators, and backwater valves. Its charter was as follows: the recommendation of suitable existing standards in cooperation with interested sponsors, or the development of adequate new standards as needed for interceptors, separators, and backwater valves as used or installed in plumbing systems.

The A112 Committee underwent a number of organizational changes over the years and is currently identified as ASME Standards Committee A112. Its Panel 14 working group, with the responsibility for backwater valves, was redesignated Project Team 14.1. The Project Team met twice to prepare this revision, which now includes criteria from the International Association of Plumbing and Mechanical Official's (IAPMO) Product Standard 38.

Suggestions for the improvement of this Standard are welcome. They should be sent to The American Society of Mechanical Engineers; Attn: Secretary, A112 Main Committee; Three Park Avenue; New York, NY 10016-5990.

This revision was approved by the A112 Main Committee and by the ASME Board on Standardization. It was approved as an American National Standard on December 31, 2003.

ASME A112 STANDARDS COMMITTEE
Standardization of Plumbing Materials and Equipment

(The following is the roster of the Committee at the time of approval of this Standard.)

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CORRESPONDENCE WITH THE A112 COMMITTEE

General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, A112 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
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Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the edition, the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation. When appropriate, proposals should be submitted using the A112 Project Initiation Request Form.

Interpretations. Upon request, the A112 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the A112 Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The A112 Standards Committee schedules meetings as needed, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the A112 Standards Committee. The A112 home page contains information on future meeting dates and locations.

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BACKWATER VALVES

1 GENERAL

1.1 Scope

This Standard establishes requirements for dimensions, performance requirements, connections, materials and finishes, testing, and marking of backwater valves. Types of backwater valves covered in this Standard include horizontal backwater valves, combination horizontal backwater valves and manual gate valves, terminal backwater valves, combination floor drains with backwater valves, vertical or 90 deg backwater valve, and related products.

1.2 Units of Measurement

Values are stated in U.S. Customary units and the International System of Units (SI). The U.S. Customary units shall be considered as the standard.

1.3 Illustrations

The figures included in this Standard are intended only to describe and portray typical types of backwater valves and are not intended to restrict design nor to be used for specification purposes.

1.4 Reference Standards

The following standards are referenced in this document (unless otherwise specified, the latest edition shall apply):

ASME B1.20.1, Pipe Threads (Excluding Dryseal)
ASME B16.1, Cast Iron Pipe Flanges and Flanged Fittings
Publisher: The American Society of Mechanical Engineers (ASME International), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

ASTM A 48, Grey Iron Castings
ASTM A 74, Cast Iron Soil Pipe and Fittings
ASTM A 307, Carbon Steel Externally Threaded Fasteners
ASTM A 351, Austenitic Steel Castings for High-Temperature Service
ASTM A 888, Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications
ASTM B 16, Free Cutting Brass Rod, Bar and Shapes for Use in Screw Machines
ASTM B 584, Copper Alloy Sand Castings for General Applications
ASTM C 564, Rubber Gaskets for Cast Iron Soil Pipe and Fittings
ASTM C 1440, Standard Specification for Thermoplastic Elastomeric (TPE) Gasket Materials for Drain, Waste, and Vent (DWV), Sewer, Sanitary and Storm Plumbing Systems
ASTM D 1784, Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D 2661, Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D 2665, Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
ASTM D 3965, Rigid Acrylonitrile-Butadiene-Styrene (ABS) Compounds for Pipe and Fittings
Publisher: The American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428

CSA B 181.1, ABS Drain Waste and Vent Pipe and Pipe Fittings
CSA B 181.2, PVC Drain Waste and Vent Pipe and Pipe Fittings
CSA B 182.1, PVC Plastic Drain and Sewer Pipe and Pipe Fittings
CSA B 602, Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe
Publisher: Canadian Standards Association, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, L4W 5N6, Canada

1.5 Definitions

backwater valve: a device installed in building drainage systems utilizing a check valve to prevent backflow. Backwater valves are designed in either normally open position or normally closed position.

normally open backwater valve: a backwater valve designed in such a manner as not to interfere with the movement of the air in the drainage system. When installed, the swing check hangs in a normally open position.

normally closed backwater valve: a backwater valve designed in such a manner that when installed, the swing check remains closed until flow causes it to open.

blow hole: hole in casting due to air or gas in the metal or mold.

cold shut: casting defects formed when two streams of metal become so cold that they do not fuse upon meeting, creating an incomplete casting.

fin: projection on castings due to imperfect joints.

flashing: a flashing is to a plastic injected molded backwater valve body as a fin is to a cast iron product.

invert to the outlet: the lowest portion of the inside of any horizontal shape. In this case, the lowest portion of the inside of the outlet.

pickle: the chemical or electrochemical removal of surface oxides such as mill scale, and/or oxides formed during storage, and weld discolorations.

1.6 Types of Backwater Valves

1.6.1 Horizontal Backwater Valve. A backwater valve designed to be installed in a horizontal drain line incorporating an internal check member to prevent backflow. (See the figure associated with Table 1.)

1.6.2 Combination Horizontal Backwater Valve and Manual Gate Valve. A backwater valve designed to be installed in a horizontal drain line incorporating an internal check member and manual gate valve to prevent backflow. (See the figure associated with Table 2.)

1.6.3 Terminal Backwater Valve. A backwater valve designed to be installed at the discharge end of a horizontal drain line incorporating a check member to prevent backflow. (See the figure associated with Table 3.)

1.6.4 Combination Floor Drain and Backwater Valve. A floor drain incorporating an internal check member to prevent backflow. (See Figs. 1, 2, and 3.)

1.6.5 Normally Open Backwater Valve. A backwater valve designed in such a manner as not to interfere with the movement of the air in the drainage system. See Fig. 4.

1.6.6 Vertical or 90-Deg Backwater Valve. A backwater valve designed to be installed in vertical piping, such as downstream from a P-trap or a holding tank. See Figs. 5, 6, and 7.

2 REQUIREMENTS

2.1 Dimensions

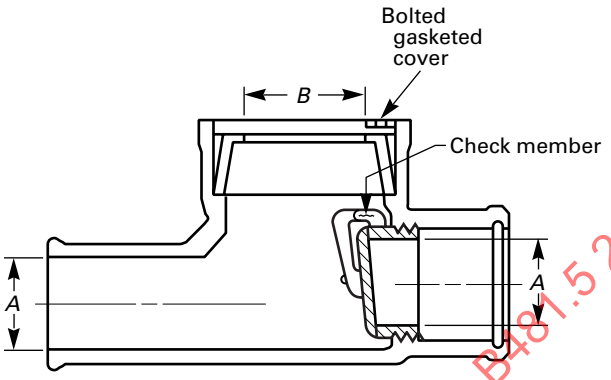
2.1.1 The backwater valve shall comply with the minimum dimensional requirements indicated in Tables 1 through 3.

2.1.2 Hub and spigot dimensions shall comply with the appropriate hub and spigot requirements of the joining materials.

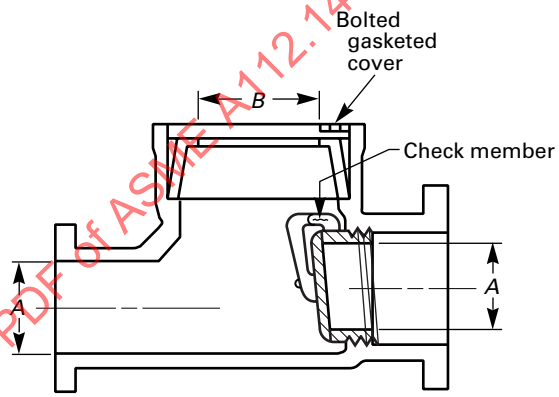
2.2 Performance Requirements

2.2.1 Normally Closed Backwater Valve. Backwater valves designed to be normally closed shall be so constructed such that when the valve is installed at the required 1:48 slope (¼ in. per foot) with respect to the direction of flow, the check member will be in a closed position when no sewage is discharged. The valve will remain sufficiently open during periods of low flows to avoid the screening of solids.

2.2.2 Normally Open Backwater Valve. Backwater valves designed to be normally open shall be so constructed such that when the valve is installed at the required 1:48 slope (¼ in. per foot) with respect to the direction of flow, the check member will be in an open



(a) Hub and Spigot Type



(b) Flanged Type

Table 1 Dimensions for Horizontal Backwater Valves

Nominal Size, in.	*A*, in. (mm)	*B*, in. (mm) Opening
2	2 (51)	3 (76)
3	3 (76)	5 (127)
4	4 (102)	6 (152)
5	5 (127)	7 (178)
6	6 (152)	8 (203)
8	8 (203)	10 (254)

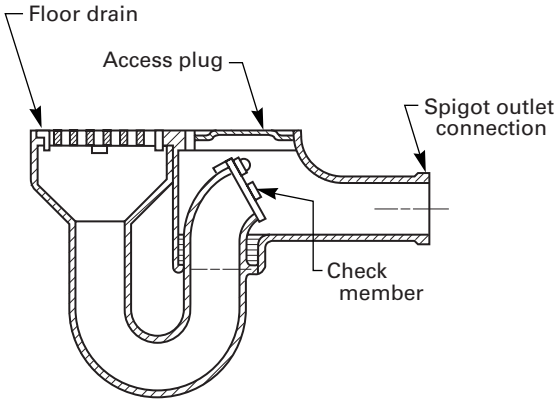


Fig. 1 Combination Floor Drain and Backwater Valve

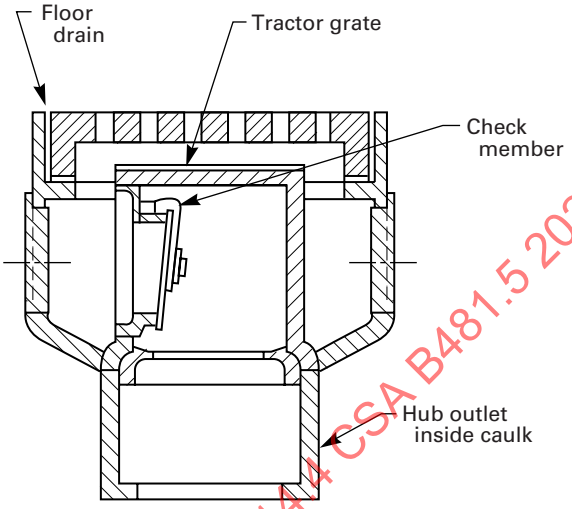


Fig. 3 Floor Drain With Tractor Grate and Backwater Valve

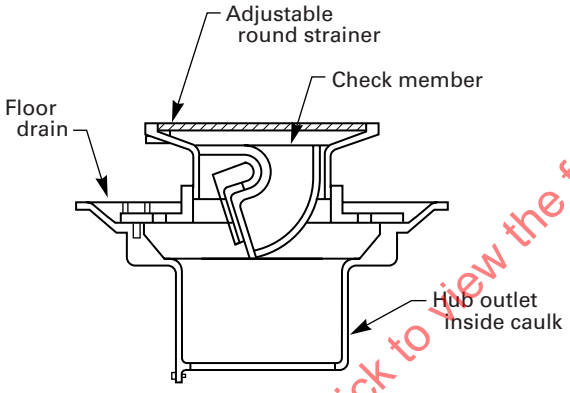


Fig. 2 Floor Drain With Adjustable Strainer and Backwater Valve

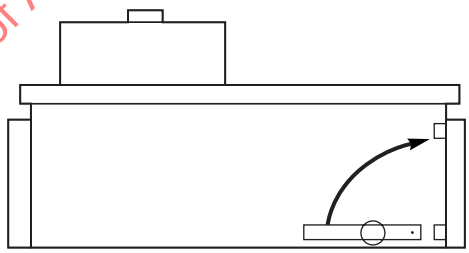


Fig. 4 Normally Open Backwater Valve

position but will close when fluid backflow occurs. The valve shall not reduce the hydraulic capacity of the connecting pipe. (See Fig. 4.)

2.2.3 Grade. The valve shall be designed and constructed such that when installed in its proper operating position in the drainage system, the upper face of the cover shall be parallel to the invert to the outlet so that the slope of the drain can be readily determined by placing a level on the top of the cover.

2.2.4 Access. The valve shall be designed to provide access to working components for repair or replacement. The size of the access shall be based upon the requirements necessary to perform the repair or maintenance. The access cover shall be water and gas tight once installed.

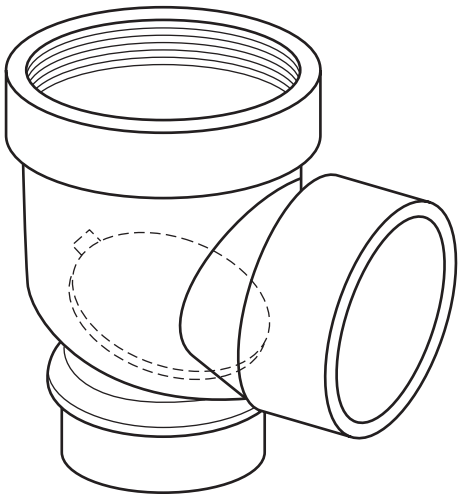


Fig. 5 Nonmetallic Vertical Backwater Valve

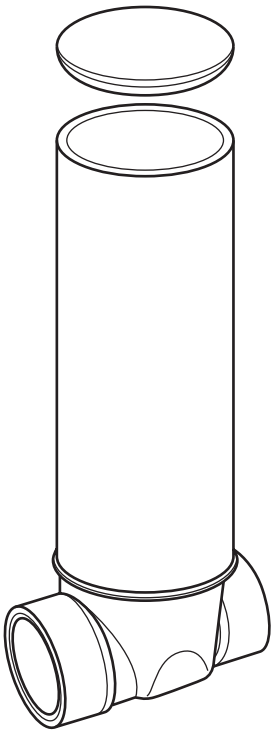


Fig. 6 Nonmetallic Backwater Valve With Access Sleeve

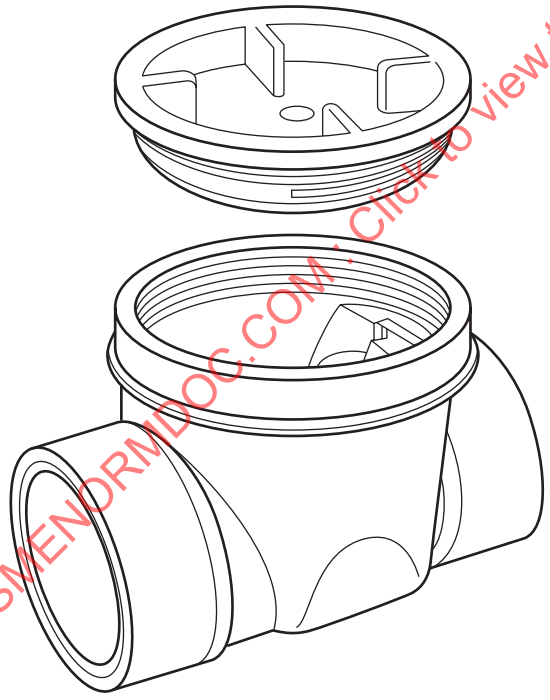
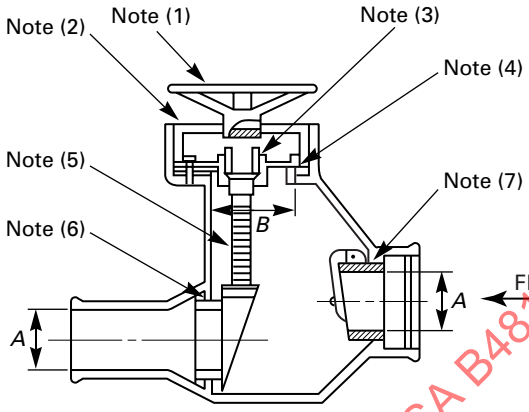
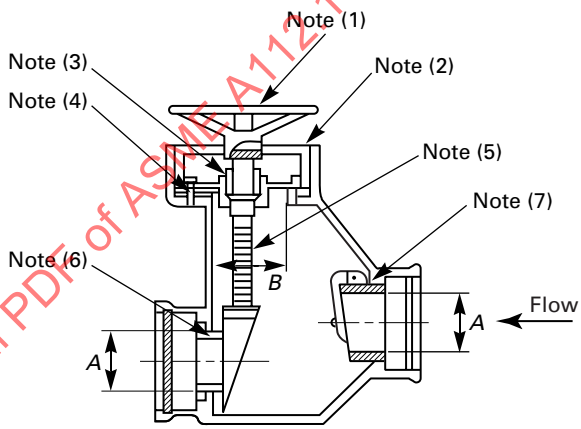


Fig. 7 Nonmetallic Horizontal Backwater Valve



(a) Hub and Spigot Type



(b) Double Hub Type

NOTES:
(1) Removable hand wheel
(2) Access cover
(3) Packing nut
(4) Gasketed gland plate
(5) Nonrising stem
(6) Gate valve and seat
(7) Check member

Table 2 Dimensions for Combination Horizontal Backwater Valve and Manual Gate Valves

Nominal Size, in.	*A*, in. (mm)	*B*, in. (mm) Opening
3	3 (76)	5 (127)
4	4 (102)	6 (152)
5	5 (127)	7 (178)
6	6 (152)	8 (203)