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ASME B16.12-1998
(Revision of ASME B16.12-1991)

CAST IRON THREADED DRAINAGE FITTINGS

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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FOREWORD

(This Foreword is not part of ASME B16.12-1998.)

Screw joint drainage fittings were developed in about 1880 by the Durham House Drainage Company of New York and are often referred to as Durham fittings. At that time, soil pipes and drains in New York had been required to be of plumber's cast iron soil pipe, whereas Chicago's soil pipes were required to be of lead or plumber's cast iron pipe.

To form a continuous passageway with no pockets or obstructions where foreign matter could collect and gradually accumulate, it was necessary to design a special type of screw fitting. Inside diameters of the fittings are about the nominal size of standard weight wrought steel pipe (Schedule 40). The thread chamber is designed so that when the pipe is tightly screwed into the fitting, its end nearly abuts the shoulder of the fitting, thereby making a practically continuous passage. The threading of these fittings required special care, and the threads on the pipe were cut to suit the threads in the fitting.

With the passage of time, manufacturers' practices began to diverge in regard to center-to-end dimensions and other features. The Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) studied the situation, developed a standard practice for these fittings, and published MSS SP-8, Cast Iron Drainage Fittings, in 1929. Subsequently, for better coordination with other screwed fitting standards under the jurisdiction of Sectional Committee B16 of the American Standards Association (ASA), now the American National Standards Institute (ANSI), the subject was assigned to Subcommittee 2 of B16.

Many drafts of the proposed standard were developed, and printer's proofs were distributed to industry for criticism and comment in May 1940. A revised proposal dated July 1941 was submitted to the members of the Sectional Committee for letter ballot vote. Following its approval by that body, it was submitted to the sponsors and to ASA with recommendations for approval as an American Standard. This was granted in February 1942, with the designation ASA B16.12-1942.

The MSS Ferrous Screw Fittings Committee made a thorough study of the 1942 standard and recommended that several changes be made to bring the data in line with current production and usage of this type of fitting. To comply with the recommendations, Subcommittee 2 of Sectional Committee B16 revised portions of the text and illustrations and added dimensional tables for Tucker connections, roof connections, and Tucker Y-branches, as well as dimensions for P-traps, bath traps, and running traps.

A draft, dated September 1952, was presented to the Sectional Committee for letter ballot vote. After the committee and other sponsor organizations approved the draft, it was presented to ASA, and approval of ASA B16.12-1953 was granted on September 11, 1953.

Subcommittee 2 reviewed the document from 1963 to 1964. The Sectional Committee approved several minor changes in format and wording, changing the title to Cast Iron Threaded Drainage Fittings. ASA B16.12-1965 was approved on November 12, 1965.

In 1970, further review was initiated by Subcommittee 2, now an ANSI Committee, and ANSI B16.12-1971 was granted approval on November 1, 1971.

The standard was updated, and metric (SI) dimensions were added in ANSI B16.12-1977, approved on February 4, 1977.

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In 1982, American Standards Committee B16 was reorganized as ASME Standards Committee B16 under procedures accredited by ANSI. Also in 1982, Subcommittee B (formerly 2) updated reference standards, and the revision was approved on July 20, 1983 as ANSI B16.12-1983. This edition and later editions are issued on a subscription service addenda basis, which permits revisions made in response to public review comments or Committee actions to be published as necessary. Addenda revisions become effective six months after the date of issuance of the addenda.

In the 1991 edition of ASME B16.12, reference standards were updated and the metric dimensions were deleted. The edition was approved by ASME and by ANSI on January 4, 1991.

In the 1998 edition of ASME B16.12, reference standards are updated, a quality system program annex is added, and several editorial revisions are made. Following approval by ASME B16 Subcommittee B and the B16 Main Committee, ANSI approved this American National Standard on November 20, 1998.

All requests for interpretations or suggestions for revisions should be sent to the Secretary, B16 Committee, The American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.

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Standardization of Valves, Flanges, Fittings, Gaskets, and Valve Actuators

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CAST IRON THREADED DRAINAGE FITTINGS

1 SCOPE

1.1 General

This Standard for cast iron threaded drainage fittings covers

(a) size[1] and method of designating openings in reducing fittings

(b) marking

(c) materials

(d) dimensions[1] and tolerances

(e) threading

(f) ribs

(g) coatings

(h) face bevel

1.2 Applicability

This Standard covers fittings intended for use in gravity drainage systems subject only to the gravity head of waste liquids at temperatures from ambient to approximately 212°F. The use of this Standard for pressurized waste handling systems is the responsibility of the user and is subject to the requirements of any applicable code.

1.3 Quality Systems

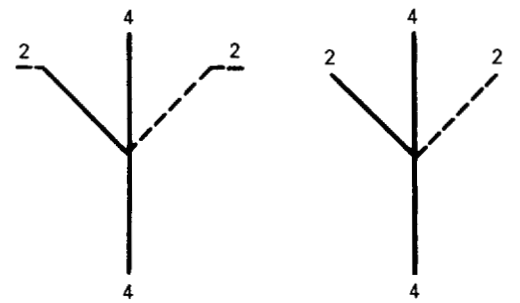
Requirements relating to the product manufacturers' quality system programs are described in Annex A.

1.4 References

Standards and specifications adopted by reference in this Standard are shown in Annex I, which is part of this Standard.

2 SIZE

The size of the fittings scheduled in Tables 1 and 2 is identified by the corresponding nominal pipe size. For reducing tees, Y-branches, or crosses, the largest run opening shall be given first. The straight-line sketches (Fig. 1) illustrate how the reducing fittings are read.



4 X 2 Single and Double Short 90 deg Y-Branch Long 90 deg Y-Branch

4 X 2 Single and Double 45 deg Y-Branch

FIG. 1 IDENTIFICATION OF REDUCING FITTINGS

3 MARKING

Each fitting shall be marked with the manufacturer's name or trademark in accordance with the requirements of MSS Standard Practice No. SP-25.

4 MATERIALS

(a) The dimensions prescribed in this Standard (Tables 3–13) are based on gray iron castings of high quality produced under regular control of chemical and physical properties by a recognized process. The manufacturer shall be prepared to certify that the product has been so produced and that its chemical and physical properties, as proved by test specimens, are equal to the requirements specified in ASTM A 126, Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

(b) Drainage fittings are regularly made of cast iron. At the option of the manufacturer, drainage fittings

[1] The use of the word *nominal* as a modifier of a dimension or size is intended to indicate that the stated dimension or size is used for designation.

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TABLE 1 INSPECTION LIMITS FOR DIAMETER AND WIDTH OF BAND

Nominal Pipe Size	Diameter and Width of Band, Minus, in.
1¼	0.035
1½	0.04
2	0.04
2½	0.05
3	0.05
4	0.06
5	0.06
6	0.07
8	0.09

TABLE 2 INSPECTION LIMITS FOR CENTER-TO-END DIMENSIONS

Nominal Pipe Size	Center-to-End, Plus or Minus, in.
1¼	0.07
1½	0.08
2	0.08
2½	0.10
3	0.10
4	0.12
5	0.12
6	0.14
8	0.16

GENERAL NOTE: The above limits apply to all fittings covered by this Standard. Inspection limits for end-to-end dimensions shall be double the limits for center-to-end dimensions. The largest opening in the fitting governs the tolerance to be applied to all openings.

may be furnished of malleable iron complying with the minimum physical requirements of ASTM A 197, Specification for Cupola Malleable Iron.

5 DIMENSIONS AND TOLERANCES

5.1 Dimensions

U.S. customary units are used in this Standard. Some dimensions of steel pipe from ASME B36.10M are listed in Annex B. Tolerances applicable to dimensions of fittings are specified in paras. 5.2 through 5.6.

5.2 Metal Thickness

At no point in the castings shall the metal thickness be less than 90% of the values listed in Table 3.

5.3 Thread Chamber

The length of thread and total length of thread chamber to shoulder shall not vary from the dimensions shown in the tables by more than plus or minus the equivalent of the pitch of one thread.

5.4 Outside Diameter and Width of Band

The minus tolerances given in Table 1 are permitted on inspection to apply to the diameter of the band and the width of the band.

5.5 Inside Diameter of Fitting

The inside diameter shall not vary from dimensions shown by more than the following:

(a) for sizes 1¼ to 4, inclusive ±0.03 in.

(b) for sizes 5 to 8, inclusive ±0.06 in.

5.6 Center-to-End

The center-to-end dimensions shall not vary from the given dimensions by more than the values given in Table 2.

5.7 Shoulder

These fittings are provided with shoulders so that when used with Standard Wall Pipe (ASME B36.10M), the end of the pipe practically meets the shoulder as the joint is made up, thereby forming a smooth passageway.

6 THREADING

(a) All fittings (except roof connections) shall be threaded with American National Standard Taper Pipe Threads (ASME B1.20.1), and the variations in threading shall be limited to one turn small and no turn large. Threaded openings without shoulder, however, shall be limited to one turn large and one turn small from the gaging notch on the plug when using working gages. Roof connections may have taper threads as above or American National Standard Straight Pipe Threads, Free Fitting Mechanical Joint (ASME B1.20.1).

(b) When gaging internal threads, the notch shall be flush with the bottom of the chamfer, which shall be considered as being the intersection of the chamfer cone and the pitch cone of the thread. This depth is approximately equal to one-half thread from the face of the fitting.

(c) All threads shall be countersunk a distance not less than one-half thread at an angle approximately 45

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deg with the axis of the thread, both for easier entrance in making a joint and for protection of the thread. Countersinking shall be concentric with the thread.

(d) The length of thread specified in this Standard shall be measured to include the countersink.

(e) The maximum allowable variation in the alignment of threads of all openings of threaded fittings shall be 0.06 in./ft.

(f) All fittings having openings of 90 deg nominal angle shall be tapped with a pitch of 0.25 in./ft, with the pitch in the direction shown in Fig. 2.

7 RIBS

The addition of ribs or lugs shall not be prohibited on any drainage fittings.

8 COATINGS

Fittings may be furnished uncoated, or may be coated with a bituminous composition or zinc coated by the hot dipped process. The coatings shall be applied prior to threading.

9 FACE BEVEL

A bevel not exceeding 5 deg is permitted on the faces of fitting openings. Center-to-end, end-to-end, and width-of-band dimensions may include or exclude the bevel.

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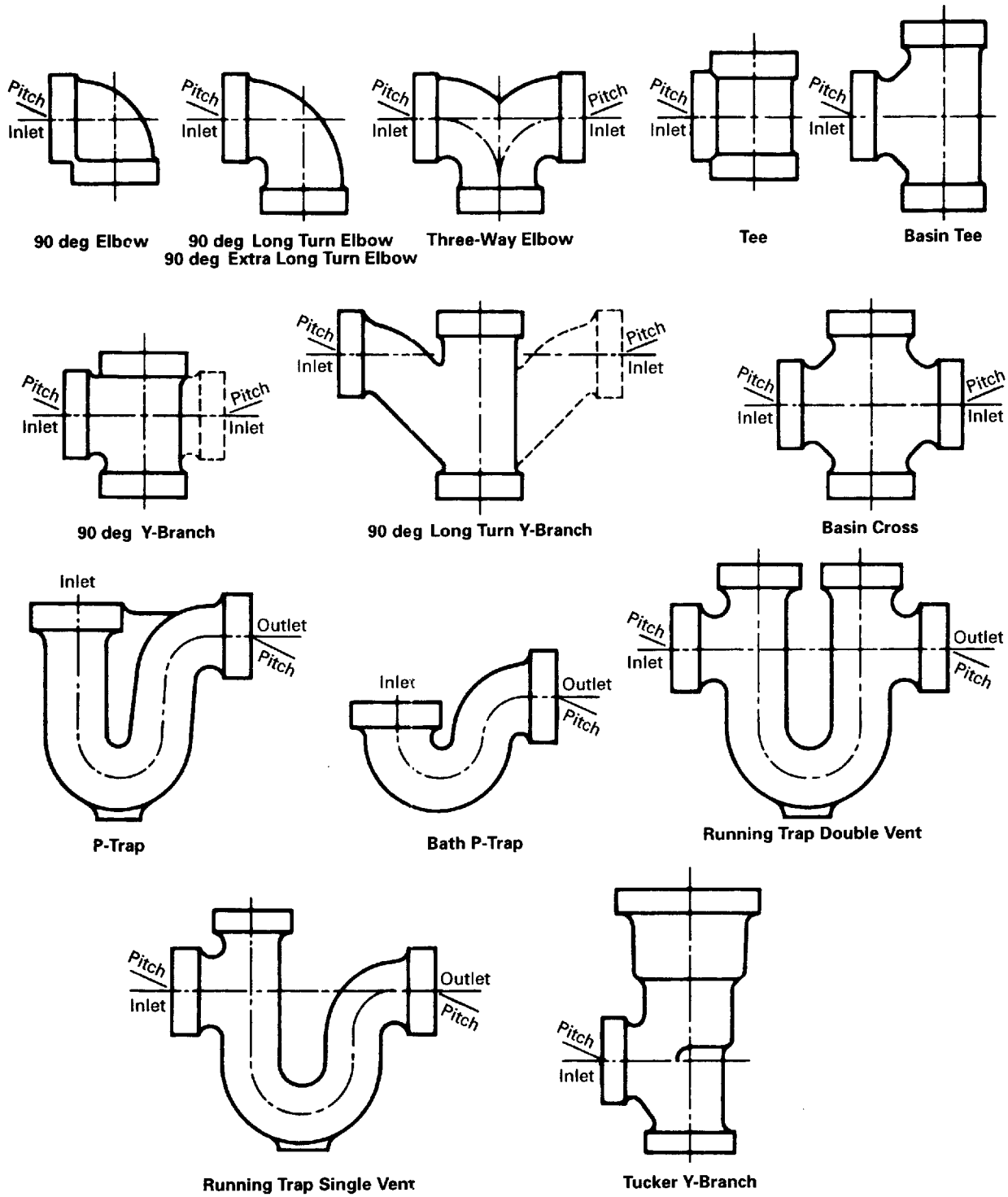

GENERAL NOTE:
Inlets of all drainage fittings have openings of 90 deg nominal angle; outlets of P-traps and bath P-traps, and both inlets and outlets of running traps are tapped, pitched 0.25 in. to the foot with the pitch in the direction shown (exaggerated for illustration). The faces of bands of pitched openings may be perpendicular to the pitch line. Similar types of reducing fittings are tapped and pitched likewise.

FIG. 2 TYPES OF FITTINGS TAPPED TO PROVIDE ¼-in. PITCH

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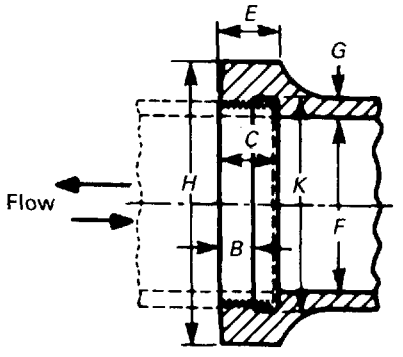
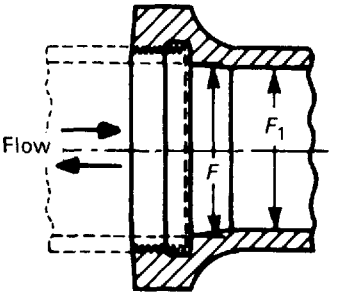
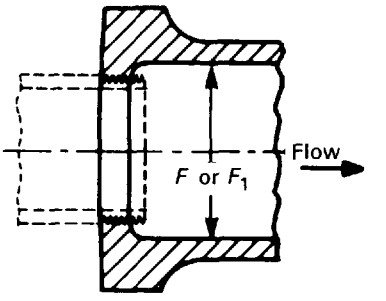


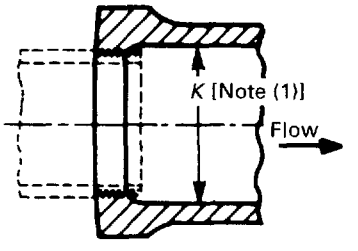
Type 1



Type 2



Type 4 (Bushed)
[Note (2)]



Type 3
[Note (2)]

TABLE 3 WALL THICKNESS AND THREADED END DIMENSIONS

Nominal Pipe Size	Length of Threads, *B*	Total Length of Thread Chamber to Shoulder, *C*	Width of Band, *E*	Inside Diameter of Fitting		Nominal Metal Thickness, *G*	Outside Diameter of Band, *H*	Recess Diameter	
				F	F_1			Max., *K*	Min., *K*
1¼	0.42	0.71	0.71	1.38	1.25	0.18	2.39	1.73	1.66
1½	0.42	0.72	0.72	1.61	1.50	0.20	2.68	1.97	1.90
2	0.44	0.76	0.76	2.07	2.00	0.22	3.28	2.44	2.37
2½	0.68	1.14	1.14	2.47	2.50	0.24	3.86	2.97	2.87
3	0.77	1.20	1.20	3.07	3.00	0.26	4.62	3.60	3.50
4	0.84	1.30	1.30	4.03	4.00	0.31	5.79	4.60	4.50
5	0.94	1.41	1.41	5.05	5.00	0.38	7.05	5.66	5.56
6	0.96	1.51	1.51	6.06	6.00	0.43	8.28	6.72	6.62
8	1.06	1.71	1.71	7.98	8.00	0.55	10.63	8.72	8.62

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Section 5.
(c) Type 2 fittings having diameters *F* and F_1 shall be tapered as shown.
(d) The shoulder and groove, Types 1 and 2, are required on outlet connections. They are also required on inlet connections that are the same size as the outlet connections. Inlet connections that are smaller than the outlet connections may be made as shown in Type 3 or Type 4, at the manufacturer's options.

NOTES:
(1) Values for *K* correspond to reduced size inlet.
(2) The openings for Types 3 and 4 are reduced size inlet.

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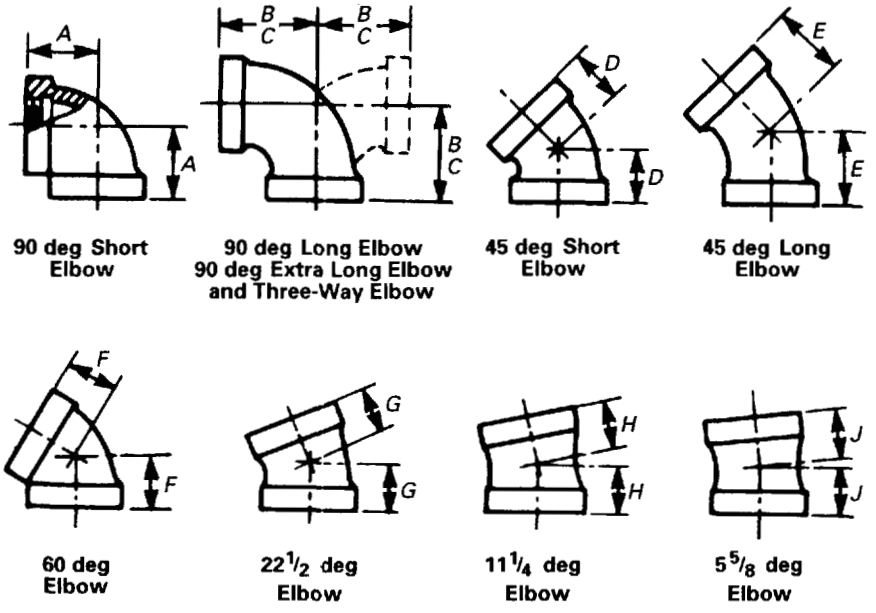

90 deg Short Elbow

90 deg Long Elbow
90 deg Extra Long Elbow
and Three-Way Elbow

45 deg Short Elbow

45 deg Long Elbow

60 deg Elbow

$22^1/_2$ deg Elbow

$11^1/_4$ deg Elbow

$5^5/_8$ deg Elbow

TABLE 4 CENTER-TO-END DIMENSIONS OF ELBOWS

	90 deg Elbow			45 deg Elbow					
Nominal Pipe Size	Short [Note (1)], *A*	Long [Note (2)] and 3-Way Elbow, *B*	Extra Long, *C*	Short [Note (1)], *D*	Long, *E*	60 deg Elbow, *F*	$22^1/_2$ deg Elbow, *G*	$11^1/_4$ deg Elbow, *H*	$5^5/_8$ deg Elbow, *J*
$1^1/_4$	1.75	2.25	3.00	1.31	1.75	1.56	1.13	1.06	1.19
$1^1/_2$	1.94	2.50	3.50	1.44	1.88	1.75	1.25	1.25	1.31
2	2.25	3.06	4.00	1.69	2.25	2.06	1.44	1.38	1.50
$2^1/_2$	2.69	3.69	4.50	1.94	2.63	2.50	1.75	1.63	1.63
3	3.06	4.25	5.25	2.19	2.94	2.88	2.00	1.81	1.75
4	3.81	5.19	6.25	2.63	3.50	3.38	2.31	2.00	1.88
5	4.50	6.13	...	3.06	4.13	3.88	2.63	2.25	2.00
6	5.13	7.13	...	3.44	4.88	4.25	2.94	2.38	2.25
8	6.56	9.00	...	4.25	...	...	...	...	...

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.

NOTES:
(1) Same dimensions as adopted for Class 125 Cast Iron Threaded Fittings (ASME B16.4).
(2) Three-way elbows have the same dimensions as 90 deg long radius elbows.

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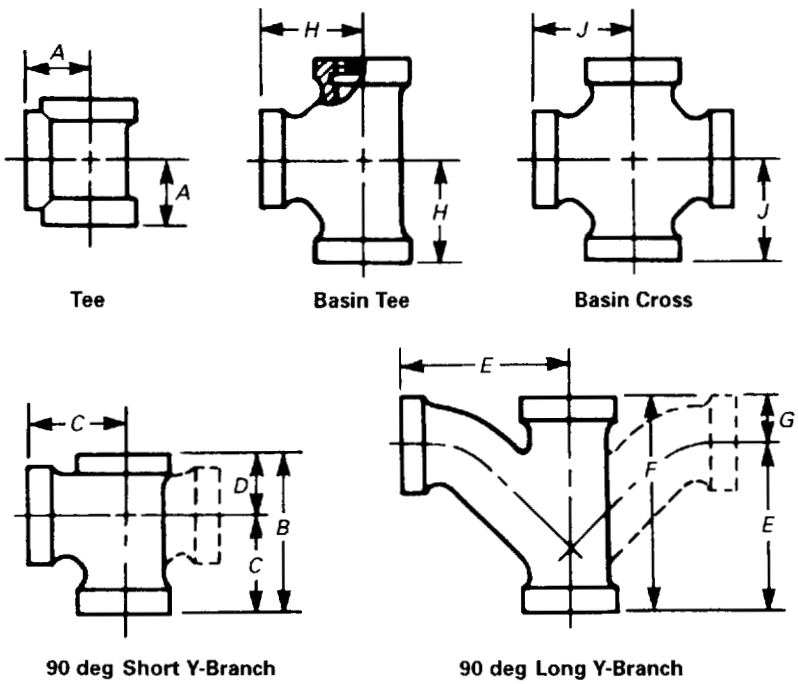

TABLE 5 DIMENSIONS OF TEES, CROSSES, AND Y-BRANCHES

Nominal Pipe Size	Center-to-End of Tee [Note (1)], *A*	90 deg Short [Note (2)] Y-Branch			90 deg Long [Note (2)] Y-Branch			Center-to-End of Basin Tee, *H*	Center-to-End of Basin Cross, *J*
		End-to-End, *B*	Center-to-End, *C*	Center-to-End, *D*	Center-to-End, *E*	End-to-End, *F*	Center-to-End, *G*		
1¼	1.75	3.75	2.25	1.50	3.63	4.75	1.13	2.31	2.31
1½	1.94	4.25	2.50	1.75	4.13	5.38	1.25	2.69	2.69
2	2.25	5.19	3.06	2.13	5.25	7.00	1.75	3.50	3.50
2½	2.70	6.31	3.69	2.63	6.25	8.25	2.00	4.25	. . .
3	3.08	7.25	4.25	3.00	7.50	9.88	2.38	. . .	. . .
4	3.79	8.75	5.19	3.56	9.88	13.00	3.13	. . .	. . .
5	4.50	10.31	6.13	4.19	12.25	15.75	3.50	. . .	. . .
6	5.13	11.94	7.13	4.81	14.63	18.75	4.13	. . .	. . .
8	6.56	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.

NOTES:
(1) Same dimensions as adopted for Class 125 Cast Iron Threaded Fittings (ASME B16.4).
(2) Double Y-branches have the same dimensions as single Y-branches.

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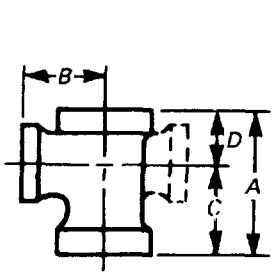
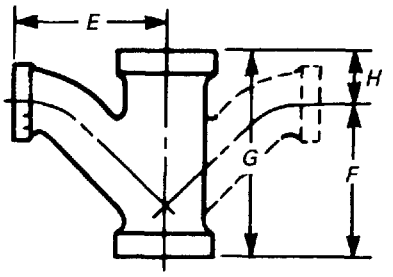


90 deg Short Y-Branch Reducing



90 deg Long Y-Branch Reducing

TABLE 6 DIMENSIONS OF Y-BRANCHES (REDUCING SIZES)

Nominal Pipe Size	90 deg Short Y-Branch End-to-End, A	Center-to-End, B	Center-to-End, C	Center-to-End, D	90 deg Long Y-Branch End-to-End, G	Center-to-End, E	Center-to-End, F	Center-to-End, H
1½ × 1¼	3.88	2.50	2.38	1.50	5.13	3.88	3.94	1.19
2 × 1½	4.63	2.94	2.69	1.94	5.75	4.38	4.44	1.31
2½ × 1½	4.88	3.06	2.81	2.06	5.75	4.56	4.44	1.31
2½ × 2	5.50	3.31	3.25	2.25	7.38	5.75	5.75	1.63
3 × 1½	5.06	3.31	2.94	2.13	5.94	5.00	4.63	1.31
3 × 2	5.69	3.63	3.31	2.38	7.56	6.06	5.94	1.63
4 × 1½	5.25	3.81	3.00	2.25	6.06	5.44	4.75	1.31
4 × 2	5.81	4.06	3.38	2.44	7.69	6.63	6.06	1.63
4 × 2½	6.63	4.44	3.81	2.81	8.63	7.06	6.63	2.00
4 × 3	7.38	4.75	4.31	3.06	10.00	8.06	7.63	2.38
5 × 1½	5.56	4.38	3.19	2.38	6.31	6.00	4.94	1.38
5 × 2	6.13	4.63	3.56	2.56	7.75	7.13	6.13	1.63
5 × 3	7.75	5.25	4.50	3.25	10.25	8.63	7.88	2.38
5 × 4	9.13	5.69	5.38	3.75	13.00	10.44	10.13	2.88
6 × 2	6.25	5.13	3.63	2.63	7.94	7.75	6.31	1.63
6 × 3	7.88	5.75	4.56	3.31	10.38	9.13	8.06	2.31
6 × 4	9.25	6.19	5.44	3.81	13.06	11.00	10.19	2.88
6 × 5	10.56	6.63	6.25	4.31	16.06	12.81	12.56	3.50

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.
(c) Double Y-branches have the same dimensions as single Y-branches.

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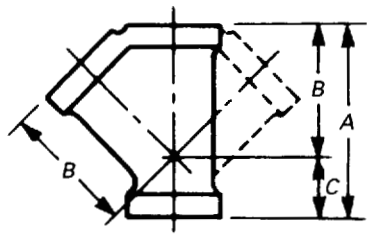

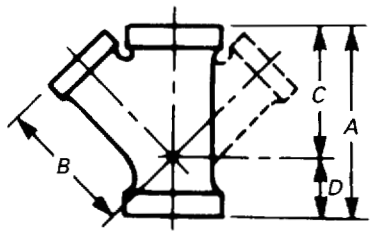

TABLE 7 DIMENSIONS OF 45 deg Y-BRANCHES

Nominal Pipe Size	End-to-End, *A*	Center-to-End, *B*	Center-to-End, *C*
1¼	5.00	3.25	1.75
1½	5.50	3.63	1.88
2	6.50	4.38	2.13
2½	7.88	5.38	2.50
3	9.00	6.19	2.81
4	10.88	7.69	3.19
5	12.94	9.19	3.75
6	14.88	10.75	4.13
8	18.81	13.56	5.25

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.
(c) Double Y-branches have the same dimensions as single Y-branches.

TABLE 8 DIMENSIONS OF 45 deg Y-BRANCHES (REDUCING SIZES)

Nominal Pipe Size	End-to-End, *A*	Center-to-End, *B*	Center-to-End, *C*	Center-to-End, *D*
1½ × 1¼	5.25	3.44	3.50	1.75
2 × 1½	5.88	4.13	4.06	1.81
2½ × 1½	6.44	4.63	4.56	1.88
2½ × 2	7.06	5.13	4.94	2.13
3 × 1½	6.63	5.06	4.94	1.69
3 × 2	7.38	5.38	5.31	2.06
3 × 2½	8.00	5.81	5.69	2.31
4 × 1½	7.19	6.06	5.75	1.44
4 × 2	7.69	6.31	6.00	1.69
4 × 3	9.25	7.19	6.88	2.38
5 × 2	8.25	7.19	6.88	1.38
5 × 3	9.81	7.88	7.63	2.19
5 × 4	11.38	8.50	8.44	2.94
6 × 2	8.44	8.06	7.56	0.88
6 × 3	10.00	8.75	8.31	1.69
6 × 4	11.88	9.38	9.06	2.81
6 × 5	13.00	10.00	9.81	3.19
8 × 4	11.44	11.00	10.44	1.00
8 × 6	14.94	12.38	11.88	3.06

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.
(c) Double Y-branches have the same dimensions as single Y-branches.

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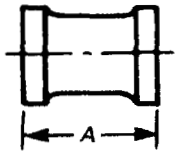

TABLE 9 DIMENSIONS OF COUPLINGS

Nominal Pipe Size	End-to-End, *A*
1¼	3.00
1½	3.38
2	3.75
2½	4.00
3	4.25
4	4.50
5	4.75
6	5.00
8	5.62

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.

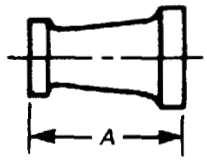

TABLE 10 DIMENSIONS OF INCREASERS

Nominal Pipe Size	End-to-End, *A*
1½ × 2	9.00
2 × 2½	9.00
2 × 3	9.00
2½ × 3	9.00
2 × 4	9.00
3 × 4	9.00
2 × 5	9.00
3 × 5	9.00
4 × 5	9.00
4 × 6	9.00
5 × 6	9.00
4 × 8	9.00
5 × 8	9.00
6 × 8	9.00

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.

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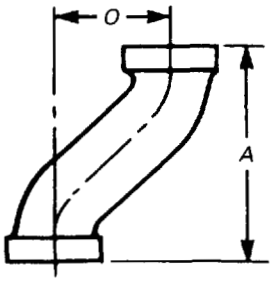

TABLE 11 DIMENSIONS OF OFFSETS

Nominal Pipe Size	Offset, *O*	End-to-End, *A*
2	4.00	7.50
2	6.00	9.50
2	8.00	11.50
2	10.00	13.50
3	4.00	8.75
3	6.00	10.75
3	8.00	12.75
3	10.00	14.75
4	4.00	9.75
4	6.00	11.75
4	8.00	13.75
4	10.00	15.75
4	12.00	17.75
5	6.00	12.63
5	8.00	14.63
5	10.00	16.63
5	12.00	18.63
6	6.00	13.63
6	8.00	15.63
6	10.00	17.63
6	12.00	19.63

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.

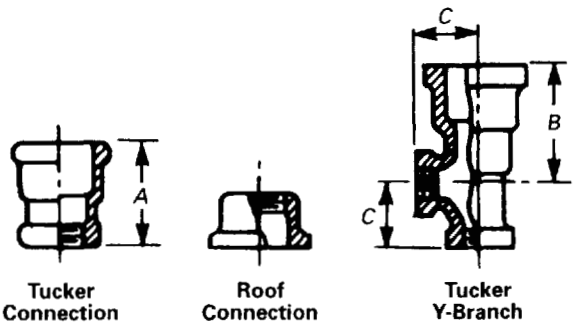

TABLE 12 DIMENSIONS OF TUCKER CONNECTIONS, ROOF CONNECTIONS, AND TUCKER Y-BRANCHES

Nominal Pipe Size	Length, *A*	Center-to-Tucker End, *B*	Center-to-Threaded End, *C*
1¼	3.75	3.94	2.25
1½	4.00	4.25	2.50
2 [Note (1)]	4.50	4.69	3.06
3	4.75	5.38	4.25
4 [Note (2)]	7.00	...	...
5 [Note (2)]	7.00	...	...
6 [Note (2)]	7.00	...	...

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For tolerances, see Table 2.
(c) The hubs on Tucker connections, roof connections, and Tucker Y-branches are designed to be used with wrought iron and steel pipe of the nominal pipe size.
(d) For pitch of Tucker Y-branch, see Fig. 2 and para. 6(f).
(e) Roof connections are not made to standard dimensions, except for the thread, which may be either straight or tapered [see para. 6(a)].

NOTES:
(1) The size 2 Tucker connection may be made of malleable iron having a diameter to fit within a nominal 4-in. building wall.
(2) These sizes are provided with loose rings to slip into hubs over wrought pipe. Other sizes may be provided with loose rings at the option of the manufacturer.

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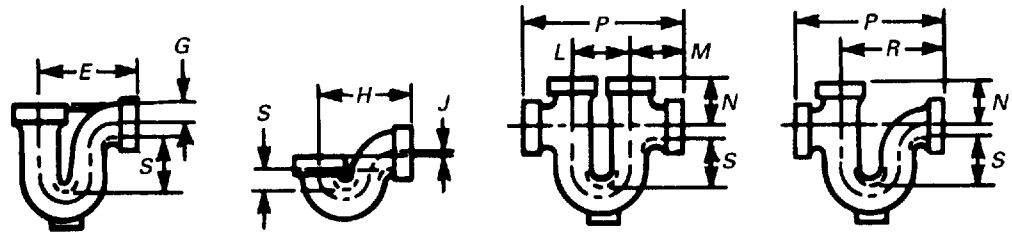

P-Trap | Bath P-Trap | Running Trap Double Vent | Running Trap Single Vent

TABLE 13 DIMENSIONS OF P-TRAPS, BATH P-TRAPS, AND RUNNING TRAPS

Nominal Pipe Size	P-Traps		Bath P-Traps		Running Traps					Water Seal, Min.,	Cleanout, Nominal Pipe Size
	E	*G*	*H*	*J*	*P*	*L*	*M*	*N*	*R*	*S*	
1¼	3.94	0.75	...	...	7.75	3.13	2.31	2.00	5.44	2.00	¾
1½	4.38	0.88	4.50	0.25	8.38	3.38	2.50	2.25	5.88	2.00	1
2	5.31	0.88	5.31	0	10.13	4.00	3.06	2.56	7.06	2.00	1
3	7.13	1.19	...	...	13.75	5.38	4.19	3.50	9.56	2.50	1¼
4	9.25	1.50	...	...	17.25	7.00	5.13	4.19	12.13	2.50	2

GENERAL NOTES:
(a) Dimensions are in inches. For pitch of traps, see Fig. 2.
(b) For tolerances, see Table 2.

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ANNEX I
REFERENCES

(This Annex is part of ASME B16.12-1998.)

The following is a list of publications referenced in this Standard.

ASME B1.20.1-1983 (R1992), Pipe Threads, General Purpose (Inch)[1]

ASME B16.4-1998, Gray Iron Threaded Fittings[1]

ASME B36.10M-1996, Welded and Seamless Wrought Steel Pipe[1]

Publisher: American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

ASTM A 126-95, Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings

ASTM A 197-87 (R1992), Specification for Cupola Malleable Iron

Publisher: American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428

ISO 9000-1: 1994, Quality management and quality assurance standards — Part 1: Guidelines for selection and use

ISO 9000-2: 1997, Quality management and quality assurance standards — Part 2: Generic guidelines for the application of ISO 9001, ISO 9002, and ISO 9003

ISO 9000-3: 1991, Quality management and quality assurance standards — Part 3: Guidelines for the application of ISO 9001 to the development, supply, and maintenance of software

ISO 9001: 1994, Quality systems — Model for quality assurance in design, development, production, installation, and servicing

ISO 9002: 1994, Quality systems — Model for quality assurance in production and servicing

ISO 9003: 1994, Quality systems — Model for quality assurance in final inspection and test

Publisher: International Organization for Standardization, 1 rue de Varembé, Case postale 56, CH-1121 Genève 20, Switzerland/Suisse

MSS SP-25-1998, Standard Marking System for Valves, Fittings, Flanges and Unions

Publisher: Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park Street, NE, Vienna, VA 22180

[1] May also be obtained from American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036.

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ANNEX A
QUALITY SYSTEM PROGRAM

(This Annex is not part of ASME B16.12-1998 and is included for informational purposes only.)

The products manufactured in accordance with this Standard shall be produced under a quality system program following the principles of an appropriate standard from the ISO 9000 series.[1] A determination of the need for registration and/or certification of the product manufacturer's quality system program by an independent organization shall be the responsibility of the manufacturer. Detailed documentation demonstrating program compliance shall be available to the purchaser at the manufacturer's facility. A written, summarized description of the program used by the product manufacturer shall be available to the purchaser upon request. The product manufacturer is defined as the entity whose name or trademark appears on the product in accordance with the marking or identification requirements of this Standard.

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[1] The series is also available from the American National Standards Institute (ANSI) and the American Society for Quality (ASQ) as American National Standards that are identified by a prefix "Q" replacing the prefix "ISO". Each standard of the series is listed in Annex I.

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ANNEX B
DIMENSIONS OF WELDED AND SEAMLESS STEEL PIPE (ASME B36.10M)

(This Annex is not part of ASME B16.12-1998 and is included for informational purposes only.)

Nominal Pipe Size	Outside Diameter	Nominal Wall Thickness, Standard Wall
1/8	0.405	0.068
1/4	0.540	0.088
3/8	0.675	0.091
1/2	0.840	0.109
3/4	1.050	0.113
1	1.315	0.133
1 1/4	1.660	0.140
1 1/2	1.900	0.145
2	2.375	0.154
2 1/2	2.875	0.203
3	3.500	0.216
3 1/2	4.000	0.226
4	4.500	0.237
5	5.563	0.258
6	6.625	0.280
8	8.625	0.322
10	10.750	0.365
12	12.750	0.375
14 outside diameter	14.000	0.375
16 outside diameter	16.000	0.375
18 outside diameter	18.000	0.375
20 outside diameter	20.000	0.375
24 outside diameter	24.000	0.375

GENERAL NOTES:

(a) Dimensions are in inches.

(b) The decimal thicknesses listed for the respective pipe sizes represent their nominal or average wall dimensions. For tolerances on wall thickness, see appropriate material specification.

(c) Thicknesses shown in boldface type are identical to corresponding thicknesses for Schedule 40 pipe.

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AMERICAN NATIONAL STANDARDS FOR PIPING, PIPE FLANGES, FITTINGS, AND VALVES

Scheme for the Identification of Piping Systems A13.1-1996
Pipe Threads, General Purpose (Inch) ..... B1.20.1-1983(R1992)
Dryseal Pipe Threads (Inch) ..... B1.20.3-1976(R1991)
Cast Iron Pipe Flanges and Flanged Fittings B16.1-1989
Malleable Iron Threaded Fittings B16.3-1992
Gray Iron Threaded Fittings B16.4-1992
Pipe Flanges and Flanged Fittings (NPS ½ Through NPS 24) B16.5-1996
Factory-Made Wrought Steel Buttwelding Fittings B16.9-1993
Face-to-Face and End-to-End Dimensions of Valves B16.10-1992
Forged Fittings, Socket-Welding and Threaded B16.11-1996
Cast Iron Threaded Drainage Fittings B16.12-1998
Ferrous Pipe Plugs, Bushings, and Locknuts with Pipe Threads B16.14-1991
Cast Bronze Threaded Fittings, Classes 125 and 250 ..... B16.15-1985(R1994)
Cast Copper Alloy Solder Joint Pressure Fittings ..... B16.18-1984(R1994)
Metallic Gaskets for Pipe Flanges: Ring-Joint, Spiral-Wound, and Jacketed B16.20-1998
Nonmetallic Flat Gaskets for Pipe Flanges B16.21-1992
Wrought Copper and Copper Alloy Solder Joint Pressure Fittings B16.22-1995
Cast Copper Alloy Solder Joint Drainage Fittings — DWV B16.23-1992
Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500, and 2500 ..... B16.24-1991
Buttwelding Ends B16.25-1992
Cast Copper Alloy Fittings for Flared Copper Tubes B16.26-1988
Wrought Steel Buttwelding Short Radius Elbows and Returns B16.28-1994
Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings — DWV B16.29-1994
Cast Copper Alloy Solder Joint Fittings for Sovent Drainage Systems B16.32-1992
Manually Operated Metallic Gas Valves for Use in Gas Piping Systems up to 125 psig (Sizes ½ Through 2) B16.33-1990
Valves — Flanged, Threaded, and Welding End B16.34-1996
Orifice Flanges B16.36-1996
Large Metallic Valves for Gas Distribution (Manually Operated, NPS 2½ to 12, 125 psig Maximum) ..... B16.38-1985(R1994)
Malleable Iron Threaded Pipe Unions B16.39-1998
Manually Operated Thermoplastic Gas Shutoffs and Valves in Gas Distribution Systems ..... B16.40-1985(R1994)
Functional Qualification Requirements for Power Operated Active Valve Assemblies for Nuclear Power Plants ..... B16.41-1983(R1989)
Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300 ..... B16.42-1987
Manually Operated Metallic Gas Valves for Use in House Piping Systems B16.44-1995
Cast Iron Fittings for Sovent® Drainage Systems B16.45-1987
Large Diameter Steel Flanges (NPS 26 Through NPS 60) B16.47-1996
Steel Line Blanks B16.48-1997
Power Piping B31.1-1995
Fuel Gas Piping (not an ANSI standard) B31.2-1968
Process Piping B31.3-1996
Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids B31.4-1992
Refrigeration Piping B31.5-1992
Gas Transmission and Distribution Piping Systems B31.8-1995
Building Services Piping B31.9-1988
Slurry Transportation Piping Systems B31.11-1989
Manual for Determining the Remaining Strength of Corroded Pipelines B31G-1991
Welded and Seamless Wrought Steel Pipe B36.10M-1995
Stainless Steel Pipe ..... B36.19M-1985(R1994)
Self-Operated and Power-Operated Safety-Related Valves Functional Specification Standard ..... N278.1-1975(R1992)

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