ASME B16.23-2011
[Revision of ASME B16.23-2002 (R2006)]

Cast Copper Alloy Solder Joint Drainage Fittings: DWV

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers
Three Park Avenue • New York, NY • 10016 USA

Date of Issuance: January 17, 2012

The next edition of this Standard is scheduled for publication in 2016.

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

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FOREWORD

Standardization work on solder joint fittings began in 1936 in Subcommittee 11 of Sectional Committee A40, Minimum Requirements for Plumbing and Standardization of Plumbing Equipment, organized within the American Standards Association (ASA). It resulted in the publication, in January 1941, of ASA A40.3-1941. That standard covered only supply (pressure) fittings.

In 1949, responsibility for solder joint fittings was transferred to newly formed Subcommittee 9 of Sectional Committee B16 on Standardization of Pipe Flanges and Fittings. The next revision of A40.3 appeared as ASA B16.18-1950, Cast-Brass Solder-Joint Fittings. During its development, however, the need for separate standards for wrought copper and wrought bronze supply fittings and for solder joint drainage fittings was recognized.

Work on the wrought fitting standard was undertaken by a joint committee of the Copper and Brass Research Association and the Manufacturers' Standardization Society of the Valve and Fittings Industry (MSS). That work, properly reviewed and approved, was published as ASA B16.22-1951.

Concurrently, in June 1949, at the request of Subcommittee 9, a task group organized by MSS began work on a standard for cast brass solder joint drainage fittings. Representatives of all U.S. and Canadian manufacturers were invited to participate. The Report of the Coordinating Committee for a National Plumbing Code was taken into account; special research on wall thickness and depth of solder joint was conducted; and coordination with other standards was sought, to avoid inconsistency. After working through nine drafts to reach consensus, the group submitted an April 1952 draft to Subcommittee 9. After committee, sponsor, and ASA approval, the standard was approved as ASA B16.23-1953, Cast Brass Solder Joint Drainage Fittings, on January 30, 1953.

Work soon began on a revision, to include additional sizes, reducing sizes, and additional types of fittings. A March 1955 draft was approved by the B16 Committee, sponsors, and ASA, and published as ASA B16.23-1955. Starting in 1958, responding to requests for further revision and expansion, the MSS task group developed a 1959 draft that was approved by Subcommittee 9, the B16 Committee, sponsors, and ASA, and was published as ASA B16.23-1960.

In 1967 and 1968, a complete revision was undertaken, including engineering studies to verify that a user request for shorter soldering cups was justified. The resulting draft, after approval by Subcommittee 9, USA Standards Committee B16, sponsors, and the (then-called) USA Standards Institute, was published as USAS B16.23-1969. An addenda, dated 1973, lengthened the cups on the three smallest sizes to overcome assembly problems.

The subcommittee, now Subcommittee I, began a new revision in 1974, resulting in the inclusion of the 1973 addenda, addition of metric equivalents, and change of "bronze" to "copper alloy." The draft, finally approved by the (again renamed) American National Standards Institute (ANSI), was published as ANSI B16.23-1976.

In 1982, a new edition updating dimensional tables and metric equivalents was developed. Following approval at all levels, the revision was published as ANSI B16.23-1984.

Also in 1982, American National Standards Committee B16 became the ASME B16 Standards Committee, operating with the same scope, under ASME procedures accredited by ANSI. Subsequently, Subcommittee I merged with Subcommittee J, which had a related scope.

The 1992 edition removed metric units, establishing U.S. Customary units as the standard. Clarifications and updating changes were made to improve the text. The 2002 edition of B16.23 added SI units of measure in the main body of text and moved U.S. Customary units to Mandatory Appendix I. A Nonmandatory Appendix for Quality System Programs was added, plus editorial changes were made to improve text. Following approval by the Standards Committee and ASME, approval as an American National Standard was given on February 6, 2002, with the designation, ASME B16.23-2002.

In this 2011 edition, references to ASME standards were revised to no longer list specific edition years; the latest edition of ASME publications applies unless stated otherwise. Following approval by the Standards Committee and the ASME Board on PTCS, this revision to the 2002 edition was approved as an American National Standard by ANSI on September 23, 2011 with the new designation, ASME B16.23-2011.

Requests for interpretation and suggestions for revision should be sent to The American Society of Mechanical Engineers, Secretary, B16 Committee, Three Park Avenue, New York, NY 10016-5990.

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Standardization of Valves, Flanges, Fittings, and Gaskets

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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, B16 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
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As an alternative, inquiries may be submitted via e-mail to: SecretaryB16@asme.org.

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 paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Proposing a Case. Cases may be issued for the purpose of providing alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee Web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard, the paragraph, figure or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Interpretations. Upon request, the B16 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 B16 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 B16 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B16 Standards Committee.

ASME B16.23-2011
SUMMARY OF CHANGES

Following approval by the ASME B16 Committee and ASME, and after public review, ASME B16.23-2011 was approved by the American National Standards Institute on September 23, 2011.

ASME B16.23-2011 includes the following change identified by a margin note, **(11)**. In addition, in the main text, the "General" section was moved to section 2, and the subsequent paragraphs were renumbered accordingly.

Page	*Location*	*Change*
78	Mandatory Appendix II	Updated

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CAST COPPER ALLOY SOLDER JOINT DRAINAGE FITTINGS: DWV

1 SCOPE

This Standard establishes specifications for cast copper alloy solder joint drainage fittings, designed for use in drain, waste, and vent (DWV) systems. These fittings are designed for use with seamless copper tube conforming to ASTM B306, Copper Drainage Tube (DWV), as well as fittings intended to be assembled with soldering materials conforming to ASTM B32, or tapered pipe thread conforming to ANSI/ASME B1.20.1.

This Standard is allied with ASME B16.29, Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings — DWV.

It provides requirements for fitting ends suitable for soldering. This Standard covers

(a) description
(b) pitch (slope)
(c) abbreviations for end connections
(d) sizes and methods for designing openings for reducing fittings
(e) marking
(f) material
(g) dimensions and tolerances

2 GENERAL

2.1 Relevant Units

This Standard states values in both SI (Metric) and U.S. Customary units. These systems of units are to be regarded separately as standard. Within the text, the U.S. Customary units are shown in parentheses or in separate tables that appear in Mandatory Appendix I. The values stated in each system are not exact equivalents; therefore, it is required that each system of units be used independently of the other. Combining values from the two systems constitutes nonconformance with the Standard.

2.2 References

Standards and specifications adopted by reference in this Standard are shown in Mandatory Appendix II, which is part of this Standard. It is not considered practical to identify the specific edition of each standard and specification in the individual references. Instead, the specific edition reference is identified in Mandatory Appendix II.

2.3 Quality Systems

Requirements relating to the product manufacturer's quality system programs are described in Nonmandatory Appendix A.

3 DESCRIPTION

(a) These fittings are designed for drainage and vent systems using the solder joint method of connection. The fitting cups, *C*, are provided with stops so that the ends of the tube, when assembled, meet the stops, thereby forming essentially smooth passageways.

(b) The sketches and designs of fittings are illustrative only. The dimensions specified herein shall govern in all cases.

4 PITCH (SLOPE)

All nominal 90-deg fittings shall be pitched to result in a slope of 21 mm/m (0.25 in./ft) (2.1%) of length of horizontal tube with reference to a horizontal plane (see Fig. 1).

5 ABBREVIATIONS

The following symbols are used to designate the type of fitting end:

C = solder-joint fitting end made to receive copper tube diameter (female)
F = internal ANSI Standard taper pipe thread (female) NPT
FTG = solder-joint fitting end made to copper tube diameter (male)
M = external ANSI Standard taper pipe thread (male) NPT
NPSM = standard straight mechanical pipe thread
SJ = end of fitting made to receive O.D. tube size

6 SIZE

(a) The size of the fittings scheduled in Tables 1 through 56 and Tables I-1 through I-56 corresponds to the drainage tube size shown in ASTM B306. The size of the threaded ends (except slip joints) corresponds to the nominal pipe size.

(b) Fittings are designated by the size of the openings in the sequence illustrated in Fig. 2.

7 MARKING

(a) Each fitting shall be marked permanently and legibly with the manufacturer's name or trademark and with "DWV" (to indicate Drain Waste Vent).

(b) Vent fittings shall be permanently marked "VENT ONLY" (See Tables 43, 44, I-43, and I-44) and show the manufacturer's name or trademark in accordance with MSS SP-25.

8 MATERIAL

Castings shall be copper alloy produced to meet

(a) the requirements of ASTM B62 Alloy C83600; or

(b) the chemical and tensile requirements of ASTM B584 Alloy 83800 or 84400, and in all other respects comply with the requirements of ASTM B62.

9 METAL THICKNESS

Dimensional variations will occur in the casting process. Pattern equipment shall be designed to produce the metal thickness given for fittings in Table 2 or Table I-2.

Any final fitting metal wall thickness less than 90% of the thickness given in the table is unacceptable.

10 INSPECTION TOLERANCE

10.1 Convention

For determining conformance with this Standard, the convention for fixing significant digits where limits (maximum and minimum values) are specified shall be as defined in ASTM E29. This requires that an observed or calculated value be rounded off to the nearest unit in the last right-hand digit used for expressing the limit. Decimal values and tolerances do not imply a particular method of measurement.

10.2 Linear Dimensions

DWV fittings covered by this Standard shall conform to the laying lengths specified in Tables 4 through 56 and Tables I-4 through I-56. An inspection tolerance, as shown in Table 1 or Table I-1, shall be allowed on center-to-shoulder, center-to-threaded end, and shoulder-to-threaded end dimensions on all fittings having internal solder (cup) ends; and on center-to-solder end, solder end-to-shoulder, and solder end-to-threaded dimensions on all fittings having external solder (fitting) ends. The largest opening in the fitting governs the tolerance to be applied to all openings.

The inspection tolerance for laying length dimensions *A*, *B*, and *C* (in Table 4 or Table I-4) shall be double those shown above, except the minus tolerance applied to couplings; dimension *A* shall not result in a dimension less than 2.3 mm (0.09 in.).

10.3 Ovality

Maximum ovality shall not exceed 1% of the maximum diameters shown in Table 2 or Table I-2. The average of the maximum and minimum diameters shall be within the dimensions shown in the table.

10.4 Alignment

The maximum allowable variations in the regular alignment of all openings shall be 5 mm per 1 m (0.06 in. per 1 ft).

10.5 Gaging of Solder Joint Ends

(a) Standard Gaging Method of Solder Joint Ends. The standard method of gaging the diameter tolerances for male and female ends shall be by the use of plain plug and ring gages designed to hold the product within the limits established in Table 2 or Table I-2.

(b) Optional Gaging Method of Solder Joint Ends. For gaging the diameter tolerance of male and female ends, the manufacturer may use direct reading instruments instead of ring and plug gages as specified in para. (a). When gaging the diameters of male and female ends, using direct reading instruments, refer to para. 10.3.

11 THREADED ENDS

11.1 General

Threaded ends shall conform to the dimensional requirements contained within Table 3 or Table I-3. Fitting threads shall be right-hand, conforming to ASME B1.20.1. They shall be taper threads (NPT) except for slip joint ends, which shall have straight pipe threads (NPSM).

11.2 Thread Dimensions

All internal threads shall be countersunk a distance not less than one-half the pitch of the thread at an angle of approximately 45 deg with the axis of the thread.

All external threads shall be chamfered at an angle of 30 deg to 45 deg from the axis. This facilitates joint assembly and thread protection. Countersinking and chamfering shall be concentric to the threads. The length of threads specified in all tables shall be measured to include the countersink or chamfer.

11.3 Threading Tolerances

Tapered pipe threads (NPT) shall be checked by use of working plug or ring gages either standard or limit types. Gages shall be threaded hand tight. The reference point for gaging internal taper threads, the plug gage, shall be screwed hand tight into the fitting. Internal product threads depend upon the chamfer diameter. When the internal chamfer diameter exceeds the major

diameter of the internal thread, the reference point shall be the last thread scratch on the chamfer cone. Otherwise, when the internal chamfer diameter does not exceed the major diameter of the internal thread, the reference point shall be the end of the fitting. On the external thread it shall be flush with the end of the fitting.

Tolerance for an internal threaded end having an internal shoulder shall be from one turn large to one turn small. Tolerance for an internal threaded end without shoulder and for an external threaded end shall be from one-half turn small to one and one-half turn large.

Straight pipe threads (NPSM) shall be checked by use of the standard GO and NO GO plug and ring gages.

12 CONFIGURATION OF THREADED ENDS

At the manufacturer's option, female ends of fittings may be furnished with a polygon or bead with or without ribs, and male ends of fittings may be furnished with a polygon, ribs, or flats.

Fig. 1 Typical Laying Lengths of DWV 90-deg Elbows

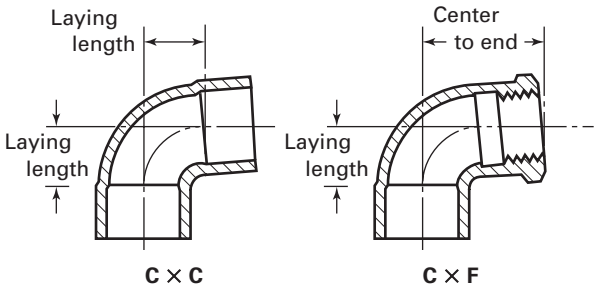


Fig. 2 Size Sequence of Fittings

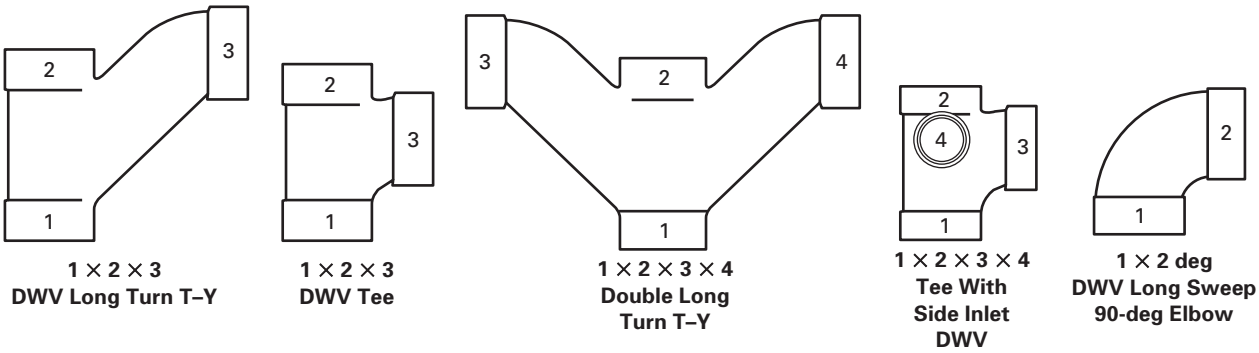
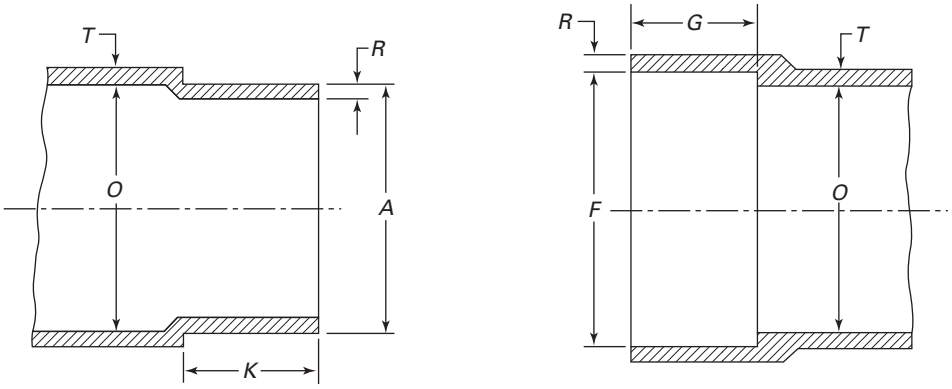


Table 1 Inspection Tolerance Table

Nominal Size	± mm
$1\frac{1}{4}$, $1\frac{1}{2}$, and 2	2.0
3	2.8
4 and 5	3.2
6 and 8	4.0

Table 2 Dimensions of Solder Joint Ends — DWV



(a) Male End (FTG) (b) Female End (C)

Nominal Size [Note (1)]	Male End			Female End			Metal Thickness [Note (4)]		Minimum Inside Diameter of Fitting, *O*
	Outside Diameter, *A* [Note (2)]		Minimum Length, *K* [Note (3)]	Inside Diameter, *F* [Note (2)]		Minimum Depth, *G*	Body, *T*	Joint, *R*	
	Min.	Max.		Min.	Max.				
1¼	34.85	34.98	14.2	35.00	35.10	12.7	2.5	1.8	32.8
1½	41.17	41.33	15.7	41.35	41.48	14.2	2.5	2.0	38.9
2	53.87	54.03	17.5	54.05	54.18	15.7	2.5	2.3	51.1
3	79.27	79.43	20.6	79.45	79.58	19.1	3.0	2.5	75.7
4	104.67	104.83	26.9	104.85	104.98	25.4	3.0	3.0	99.8
5	130.07	130.23	33.3	130.25	130.38	31.8	4.8	4.8	124.7
6	155.47	155.63	41.1	155.65	155.78	38.1	4.8	4.8	149.4
8	206.22	206.43	53.8	206.45	206.58	50.8	5.6	5.6	197.6

GENERAL NOTES:

(a) Primary dimensions are in millimeters.

(b) The sketches and designs of fittings are illustrative only. The dimensions herein shall govern in all cases.

NOTES:

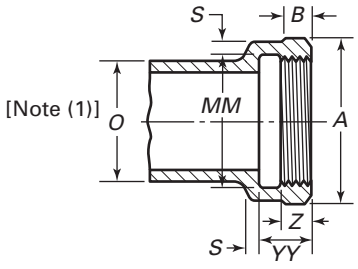
(1) For size designation of fitting, see section 6.

(2) For ovality, see para. 10.3.

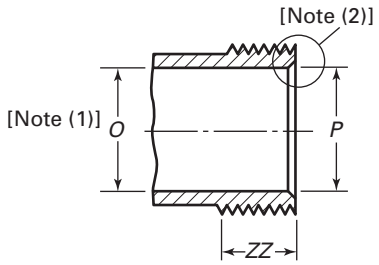
(3) *K* dimensions of 11.2 mm, 12.7 mm, and 142 mm and *G* dimensions of 9.7 mm, 11.2 mm, and 12.7 mm, respectively for 1¼-in., 1½-in., and 2-in. sizes are sound and acceptable from an engineering standpoint. However, the cup depths specified in Table 2 are to provide greater facility in making installations.

(4) For metal thickness tolerance, see section 9.

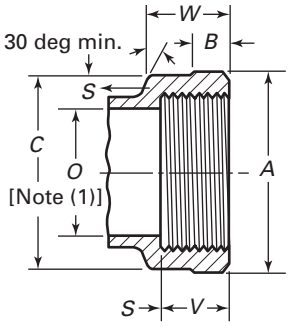
Table 3 Dimensions of Threaded Ends — DWV



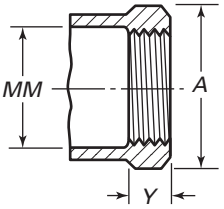
Female Threaded End (F)



Male Threaded End (M)



Female Threaded End (F)



Male Threaded End (M)

Nominal Thread Size [Note (3)]	Minimum Dia. of Band or Across Flats of Polygon, *A*	Minimum Band Length, *B*	Minimum Dia. of Body Over Thread, *C*	Minimum Dia. of Recess, *MM* [Note (4)]	Minimum Depth of Full Thread, *V*	Minimum, *W*	Minimum Length of Thread, *Y*	Minimum End To Shoulder, *YY* ±1.5 [Note (4)]	Minimum Thread End Wall, *S* [Note (5)]	Maximum Thread End Bore, *P* [Note (4)]	Minimum Length of Effective Thread, *ZZ*
1¼	48.5	7.9	48.3	42.2	18.0	25.4	10.7	17.8	3.05	33.27	18.034
1½	55.1	8.6	55.1	48.5	18.3	25.4	10.7	18.3	3.30	39.37	18.3
2	68.3	10.4	68.1	60.5	19.3	26.2	11.2	19.1	3.81	51.56	19.3
3	98.6	14.0	98.6	88.9	30.5	37.1	19.6	30.5	4.83	77.47	30.5
4	125.5	16.8	125.5	114.3	33.0	38.9	21.3	33.0	5.59	102.87	33.0
5	155.4	19.8	155.4	141.2	35.8	42.2	23.9	35.8	7.11	126.49	35.8
6	185.4	22.4	185.4	168.1	38.4	42.7	24.4	38.1	8.64	153.16	38.4
8	238.3	28.4	238.0	218.9	43.4	44.5	26.9	43.2	9.53	201.93	43.4

GENERAL NOTES:

(a) Dimensions are in millimeters.

(b) For threads of threaded ends, see section 11.

NOTES:

(1) For inside diameter of fitting, see Table 2.

(2) 1¼, 1½, and 2 male threaded ends may have inside chamfer for slip nut connections.

(3) Thread size is American National Standard Pipe Threads, General Purpose (Inch), ANSI/ASME B1.20.1.

(4) Dimensions computed using formula $E_1 - h - 2T$.

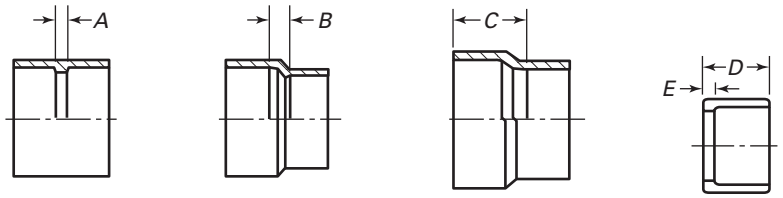
E_1 = thread pitch diameter from ANSI/ASME B1.20.1

h = height of thread from ANSI/ASME B1.20.1

T = metal thickness from Table 2

(5) For initial thickness tolerance, see section 9.

Table 4 Dimensions for DWV Couplings, Reducers, Extended Bushings, and Flush Bushings

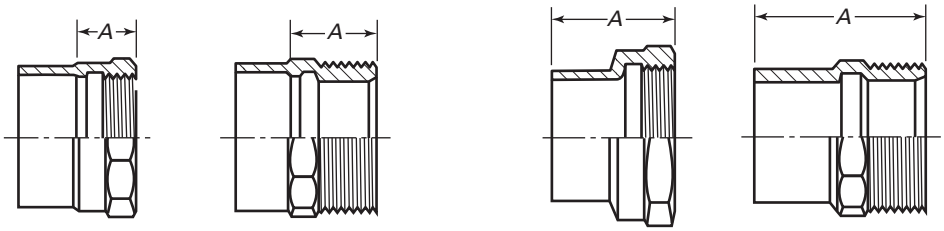


DWV Coupling C × C | DWV Reducer C × C | DWV Extended Bushing FTG × C | DWV Flush Bushing FTG × C

Nominal Size	Coupling, *A*	Reducer, *B*	Extended Bushing, *C*	Flush Bushing	
				D	*E*
1¼	3.0	...	...	...	...
1½	3.0	...	...	...	...
1½ × 1¼	...	6.4	19.1	15.7	3.0
2	3.0	...	...	...	...
2 × 1½	...	9.7	23.1	17.5	3.3
2 × 1¼	...	11.2	23.9	17.5	4.8
3	4.8	...	...	...	...
3 × 2	...	19.1	35.1	20.6	4.8
3 × 1½	...	23.9	33.3	20.6	6.4
3 × 1¼	...	23.9	33.3	...	...
4	4.8	...	...	...	...
4 × 3	...	8.6	41.1	26.9	7.9
4 × 2	...	12.7	44.5	...	...
4 × 1½	...	38.1	...	...	...
5	6.4	...	...	...	...
5 × 4	...	14.2	39.6	...	...
5 × 3	...	22.4	47.8	...	...
6	6.4	...	...	...	...
6 × 5	...	13.5	74.7	...	...
8	9.7	...	...	...	...
8 × 6	...	35.1	...	...	...

GENERAL NOTE: Dimensions are in millimeters.

Table 5 Dimensions of DWV Adapters



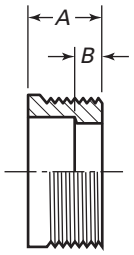
C × F C × M FTG × F FTG × M

DWV Adapters

Nominal Size	C × F, *A*	C × M, *A*	FTG × F, *A*	FTG × M, *A*
1¼	20.6	23.9	37.3	49.3
1¼ × 2	23.9	33.3	. . .	. . .
1¼ × 1½	20.6	28.4	. . .	. . .
1½	20.6	23.9	38.9	52.3
1½ × 2	22.4	31.8	. . .	. . .
1½ × 1¼	20.6	26.9	. . .	. . .
2	22.4	23.9	41.4	60.5
2 × 3	47.8	. . .	. . .	. . .
2 × 1½	22.4	26.9	. . .	. . .
2 × 1¼	22.4	26.9	. . .	. . .
3	38.1	39.6	60.5	76.2
3 × 4	57.2	. . .	. . .	. . .
3 × 2	39.6	36.6	. . .	. . .
4	42.2	41.1	71.4	91.9
4 × 3	42.9	. . .	. . .	. . .
5	49.3	44.5	. . .	. . .
6	55.6	50.8	96.8	. . .
8	66.5	85.9	111.3	. . .

GENERAL NOTE: Dimensions are in millimeters.

Table 6 Dimensions of DWV Short Adapters

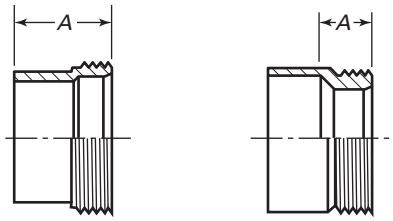


C × M
DWV Short Adapters

	C × M	
Nominal Size	*A*	*B*
$1\frac{1}{4}$	25.4	12.7
$1\frac{1}{2}$	25.4	11.2
$1\frac{1}{4} \times 1\frac{1}{2}$	25.4	12.7
2	28.4	12.7
$1\frac{1}{2} \times 2$	30.2	15.7

GENERAL NOTE: Dimensions are in millimeters.

Table 7 Dimensions of DWV Trap Adapters

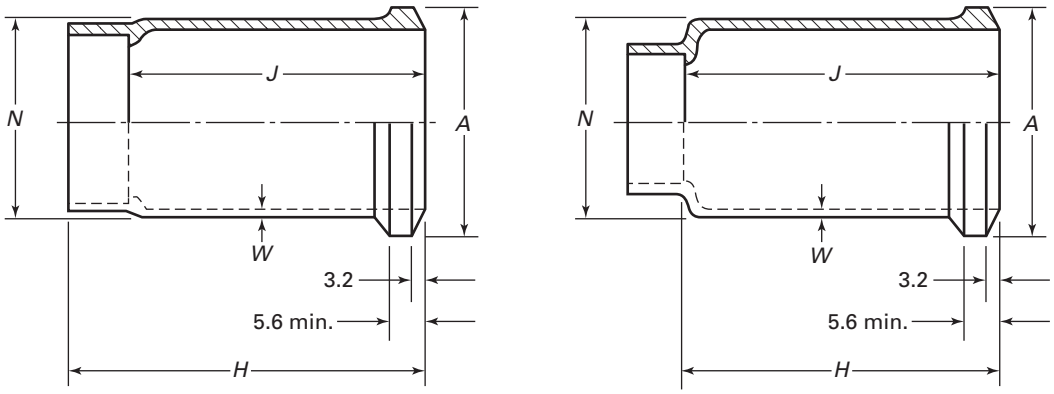


FTG × SJ **C × SJ**
DWV Trap Adapters

Nominal Size	FTG × SJ, *A*	C × SJ, *A*
$1\frac{1}{4}$	30.2	15.7
$1\frac{1}{2}$	31.8	17.5
$1\frac{1}{2} \times 1\frac{1}{4}$	. . .	17.5
2	. . .	17.5
$2 \times 1\frac{1}{2}$	. . .	17.5

GENERAL NOTES:
(a) Primary dimensions are in millimeters.
(b) For dimensions of slip joint ends, see Table 49.

Table 8 Dimensions of C to Soil Pipe Adapter for Joining to Extra Heavy Soil Pipe



Straight Sizes Reducing Sizes

DWV Soil Pipe Adapter — C × Spigot

Nominal Size Soil Pipe, C × Spigot [Note (1)]	Diameter of Bead, *A*		Body Wall, *W*	Body Outside Diameter [Note (2)], *N* ±2.286 mm	Body Length [Note (3)], *H* ±1.524 mm	Laying Length, *J*
	Min.	Max.				
2 × 2	69.9	68.3	2.5	60.5	63.5	63.5
1 × 2	69.9	68.3	2.5	60.5	82.6	58.7
$1\frac{1}{2}$ × 2	69.9	68.3	2.5	60.5	82.6	58.7
$1\frac{1}{4}$ × 2	69.9	68.3	2.5	60.5	82.6	84.1
3 × 3	98.6	96.8	3.0	88.9	69.9	69.9
2 × 3	98.6	96.8	3.0	88.9	88.9	90.4
$1\frac{1}{2}$ × 3	98.6	96.8	3.0	88.9	88.9	90.4
4 × 4	124.0	122.2	3.0	114.3	76.2	76.2
3 × 4	124.0	122.2	3.0	114.3	95.3	96.8
2 × 4	124.0	122.2	3.0	114.3	95.3	98.6
$1\frac{1}{2}$ × 4	124.0	122.2	3.0	114.3	95.3	98.6
5 × 5	149.4	147.6	4.8	139.7	76.2	76.2
6 × 6	174.8	173.0	5.6	165.1	76.2	76.2

GENERAL NOTE: Dimensions are taken in millimeters.

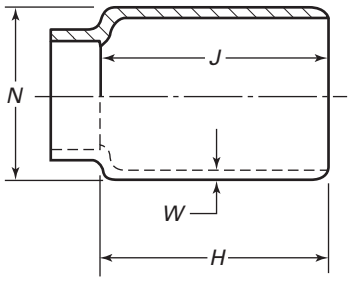
NOTES:

(1) Dimensions given are for extra heavy weight soil pipe. Refer to ASTM A74. For service weight, *A* and *N* may be reduced as shown in Table 2 of ASTM A74. Service weight adapters should be marked “SW” or “SERVICE WEIGHT.”

(2) *N* is taken from outside diameter of XH soil pipe.

(3) *H* body lengths are based on “telescoping lengths of XH soil pipe hubs.”

Table 9 Dimensions of C to Soil Pipe Adapter — Plain End for Joining to Extra Heavy Soil Pipe



C × Soil Pipe
DWV Soil Pipe Adapters — Plain End
[Note (1)]

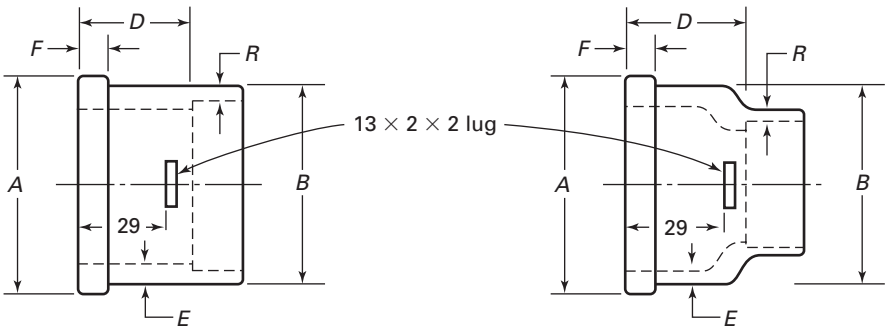
Nominal Size	Body Length, *H* ±1.524 mm	Body Outside Diameter, *N* ±2.286 mm	Body Wall, *W*	Laying Length, *J*
2 × 2	63.5	60.5	2.5	63.5
$1\frac{1}{4}$ × 2	63.5	60.5	2.5	65.0
$1\frac{1}{2}$ × 2	63.5	60.5	2.5	65.0
3 × 3	69.9	88.9	3.0	69.9
2 × 3	69.9	88.9	3.0	71.4
3 × 4	76.2	114.3	3.0	77.7

GENERAL NOTE: Dimensions are in millimeters.

NOTE:

(1) For use with elastomer gasket.

Table 10 Dimensions of C × No-Hub Soil Pipe Adapter



Straight Sizes **Reducing Sizes**

DWV Soil Pipe Adapter — C × No-Hub
[Note (1)]

Nominal Size C × No-Hub	Diameter of Bead, *A* ±1.524 mm	Outside Diameter of Body, *B* ±1.524 mm	Laying Length, *D*	Metal Thickness [Note (2)]		Minimum Width Bead, *F* +3.302 mm −0.0 mm
				Body, *E*	Joint, *R*	
2	60.5	58.7	31.0	2.54	2.29	6.4
1½ × 2	60.5	58.7	31.8	2.54	1.98	6.4
1¼ × 2	60.5	58.7	32.5	2.54	1.83	6.4
3	86.6	84.8	31.0	3.05	2.62	6.4
2 × 3	86.6	84.8	31.8	3.05	2.29	6.4
1½ × 3	86.6	84.8	32.5	3.05	1.98	6.4
4	112.8	111.3	31.0	3.05	3.05	7.9
3 × 4	112.8	111.3	31.8	3.05	2.62	7.9

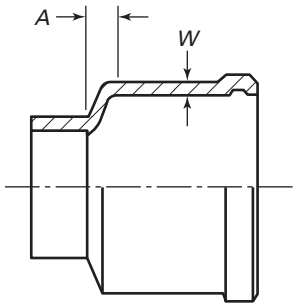
GENERAL NOTE: Dimensions are in millimeters.

NOTES:

(1) For use with stainless steel clamp and elastomer gasket.

(2) For metal thickness tolerance, see section 9.

Table 11 Dimensions of C × Hub Soil Pipe Adapter

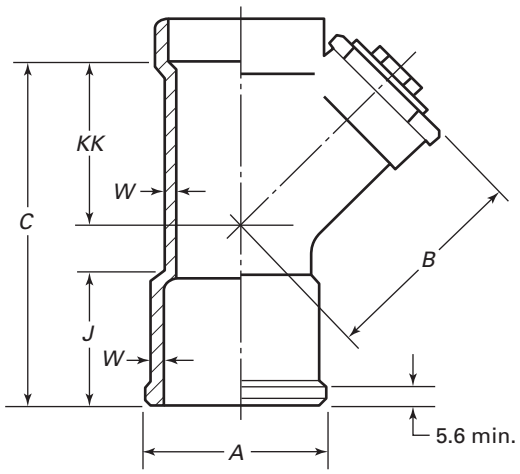


DWV Soil Pipe Adapter
C × Hub

Nominal Size	A	W
3	9.7	3.0
3 × 4	11.2	3.0
4	4.8	3.0

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) For hub dimensions, see ASTM A74.

Table 12 Dimensions of DWV 45-deg Y With Cleanout — Soil Pipe (Spigot) × C × Cleanout

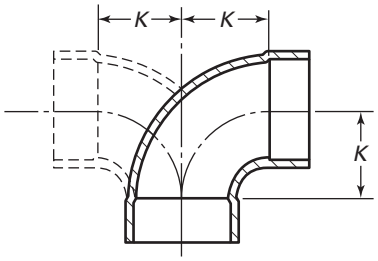


DWV 45-deg Y With Cleanout

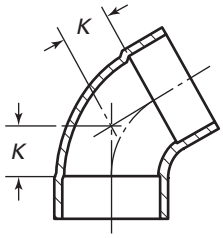
Nominal Size	A		Maximum, B	C	J	KK	W
	Max.	Min.					
4 × 3 × 3	122.7	122.2	130.0	215.9	76.2	104.6	3.0

GENERAL NOTE: Dimensions are in millimeters.

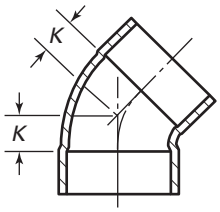
Table 13 Dimensions of DWV Elbows and Double Elbows — C × C



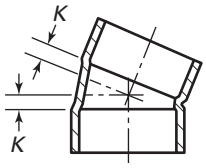
DWV 90-deg Elbow
C × C and C × C × C



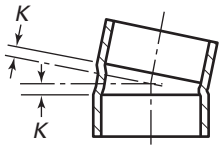
DWV 60-deg Elbow
C × C



DWV 45-deg Elbow
C × C



DWV $22\frac{1}{2}$-deg Elbow
C × C

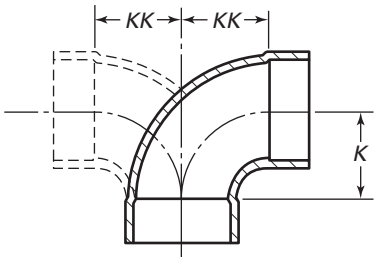


DWV $11\frac{1}{4}$-deg Elbow
C × C

Angle	Dimension	Nominal Size							
		$1\frac{1}{4}$	$1\frac{1}{2}$	2	3	4	5	6	8
DWV 90-deg elbow, C × C	*K*	30.2	36.6	49.3	74.7	98.6	124.0	147.6	198.4
DWV 60-deg elbow, C × C	*K*	17.5	20.6	28.4	42.9	57.2	73.2	88.9	117.3
DWV 45-deg elbow, C × C	*K*	12.7	14.2	20.6	30.2	41.1	52.3	63.5	84.1
DWV $22\frac{1}{2}$-deg elbow, C × C	*K*	4.8	6.4	9.7	14.2	19.1	23.9	28.4	38.1
DWV $11\frac{1}{4}$-deg elbow, C × C	*K*	3.0	3.0	4.8	6.4	7.9	10.4	12.7	16.8

GENERAL NOTE: Dimensions are in millimeters.

Table 14 Dimensions of Reducing DWV Single and Double Elbows — C × C

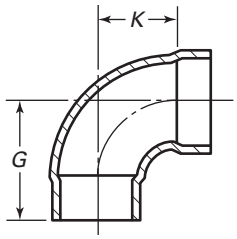


DWV 90-deg Elbow, C × C
DWV Double Elbow, C × C × C

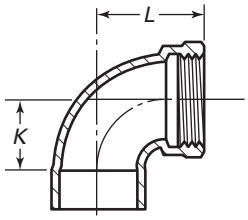
Angle	Dimension	Nominal Size C × C or C × C × C			
		1½ × 1¼	2 × 1½	2 × 1¼	4 × 3
DWV 90-deg reducing elbow, C × C	*K*	30.2	36.6	30.2	71.4
	KK	33.3	42.9	39.6	76.2

GENERAL NOTE: Dimensions are in millimeters.

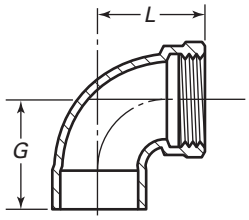
Table 15 Dimensions of DWV Elbows



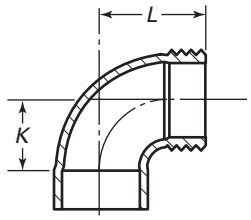
DWV 90-deg Elbow
FTG × C



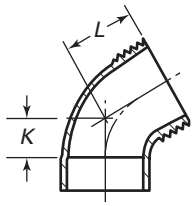
DWV 90-deg Elbow
C × F



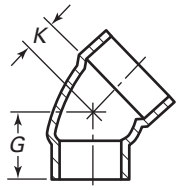
DWV 90-deg Elbow
FTG × F



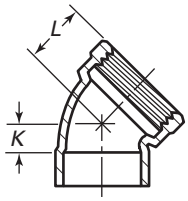
DWV 90-deg Elbow
C × M



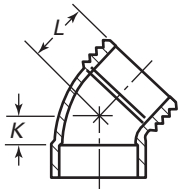
DWV 60-deg Elbow
C × M



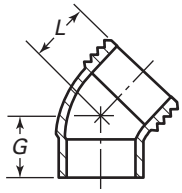
DWV 45-deg Elbow
FTG × C



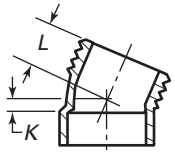
DWV 45-deg Elbow
C × F



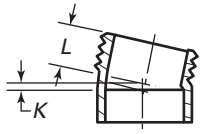
DWV 45-deg Elbow
C × M



DWV 45-deg Elbow
FTG × M



DWV $22^1/_2$-deg Elbow
C × M



DWV $11^1/_4$-deg Elbow
C × M

Angle	Dimensions	Nominal Size				
		$1^1/_4$	$1^1/_2$	2	3	4
DWV 90-deg elbow, FTG × C	*K*	30.2	36.6	49.3	74.7	98.6
	G	44.5	53.8	68.3	95.3	124.0
DWV 90-deg elbow, C × F	*K*	30.2	36.6	49.3	74.7	98.6
	L	47.8	53.8	68.3	100.1	125.5
DWV 90-deg elbow, FTG × F	*G*	44.5	52.3	68.3	95.3	122.2
	L	47.8	53.8	68.3	100.1	127.0
DWV 90-deg elbow, C × M	*K*	30.2	36.6	49.3	74.7	98.6
	L	47.8	53.8	71.4	100.1	125.5
DWV 45-deg elbow, FTG × C	*K*	12.7	14.2	20.6	30.2	41.1
	G	25.9	30.2	38.1	50.8	68.3

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) See Table 16 for reducing sizes.
(c) See Table 17 for continuation of dimensions.

Table 16 Dimensions of DWV Reducing Elbows

Nominal Size	DWV 90-deg Elbow, C × F		DWV 90-deg Elbow, C × M	
	K	*L*	*K*	*L*
1½ × 1¼	33.3	50.8	33.3	47.8

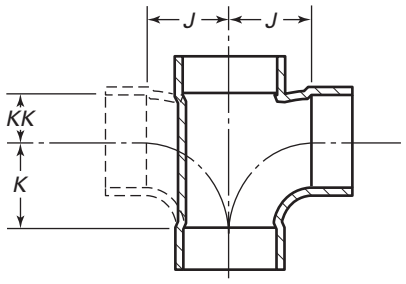
GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) Refer to illustrations for Table 15.

Table 17 Dimensions of DWV Elbows

Angle	Dimensions	Nominal Size		
		1¼	1½	2
DWV 60-deg elbow, C × M	*K*	16.8	20.6	27.7
	L	32.5	38.1	46.7
DWV 45-deg elbow, C × F	*K*	7.6	9.1	19.1
	L	32.5	35.1	42.2
DWV 45-deg elbow, C × M	*K*	12.7	14.2	19.1
	L	30.2	33.3	33.8
DWV 45-deg elbow, FTG × M	*L*	26.9	31.8	33.8
	G	26.2	30.2	33.0
DWV 22½-deg elbow, C × M	*K*	4.8	6.4	8.6
	L	20.6	23.9	27.7
DWV 11¼-deg elbow, C × M	*K*	3.0	3.0	4.8
	L	19.1	20.5	23.9

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) Refer to illustrations for Table 15.

Table 18 Dimensions of DWV Tees and Double Tees

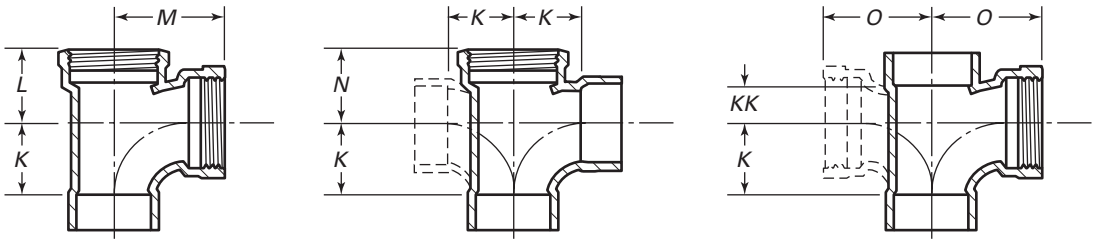


DWV Tees
C × C × C
C × C × C × C

Nominal Size	*J*	*K*	*KK*
1¼	30.2	30.2	17.5
1½	36.6	36.6	20.6
1½ × 1½ × 1¼	33.3	30.2	17.5
1½ × 1¼ × 1½	36.6	36.6	20.6
1½ × 1¼ × 1¼	33.3	30.2	19.1
2	49.3	49.3	25.4
2 × 2 × 1½	42.9	36.6	20.6
2 × 2 × 1¼	39.6	30.2	17.5
2 × 1½ × 2	49.3	49.3	25.4
2 × 1½ × 1½	42.9	36.6	20.6
2 × 1½ × 1¼	42.9	36.6	19.1
3	74.7	74.7	38.1
3 × 3 × 2	62.0	49.3	25.4
3 × 3 × 1½	55.6	36.6	20.6
3 × 3 × 1¼	52.3	30.2	17.5
3 × 2 × 3	74.7	74.7	32.5
3 × 2 × 2	62.0	49.3	24.6
3 × 2 × 1½	71.4	36.6	21.3
3 × 1½ × 3	74.7	74.7	31.8
3 × 1½ × 1½	55.6	36.6	17.5
4	98.6	98.6	52.3
4 × 4 × 3	87.4	74.7	38.1
4 × 4 × 2	73.2	49.3	25.4
4 × 4 × 1½	66.5	36.6	20.6
4 × 4 × 1¼	63.5	30.2	17.5
4 × 2 × 4	98.6	98.6	31.8
5	124.0	124.0	58.7
5 × 5 × 4	111.3	98.6	49.3
6	147.6	147.6	69.9
6 × 6 × 4	124.0	98.6	49.3
6 × 4 × 4	122.2	98.6	38.1
8	198.4	198.4	87.4
8 × 8 × 6	169.9	147.6	68.3
8 × 6 × 6	171.5	147.6	58.7

GENERAL NOTE: Dimensions are in millimeters.

Table 19 Dimensions of DWV Tees and Double Tees



C × F × F

C × F × C
C × F × C × C

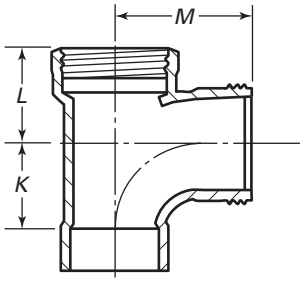
C × C × F
C × C × F × F

DWV Tees and Double Tees

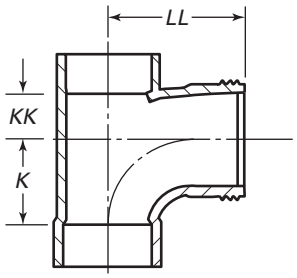
Nominal Size	*K*	*L*	*M*	*N*	*O*	*KK*
1¼	30.2	35.1	47.8	35.1	47.8	17.5
1½	36.6	39.6	55.6	38.1	53.8	20.6
1½ × 1½ × 1¼	30.2	39.6	55.6	. . .	50.8	17.5
1½ × 1¼ × 1½	36.6	39.6	55.6	. . .	53.8	20.6
2	49.3	44.5	68.3	44.5	68.3	25.4
2 × 2 × 1½	36.6	44.5	60.5	. . .	60.5	20.6
2 × 2 × 1¼	30.2	44.5	57.2	. . .	57.2	17.5
2 × 1½ × 1½	36.6	39.6	60.5	. . .	60.5	22.4
2 × 1½ × 2	49.3	. . .	. . .	44.5	. . .	. . .
3	74.7	68.3	100.1	63.5	100.1	38.1
3 × 3 × 2	49.3	. . .	. . .	. . .	81.0	25.4
3 × 3 × 1½	36.6	. . .	. . .	. . .	73.2	20.6
3 × 3 × 1¼	30.2	. . .	. . .	. . .	69.9	17.5
4	98.6	84.1	125.5	84.1	125.5	49.3
4 × 4 × 3	74.7	. . .	. . .	. . .	112.8	38.1
4 × 4 × 2	49.3	. . .	. . .	. . .	91.9	25.4
4 × 4 × 1½	36.6	. . .	. . .	. . .	84.1	20.6
4 × 4 × 1¼	30.2	. . .	. . .	. . .	81.0	17.5

GENERAL NOTE: Dimensions are in millimeters.

Table 20 Dimensions of DWV Trap Tees



DWV Trap Tees
C × F × SJ

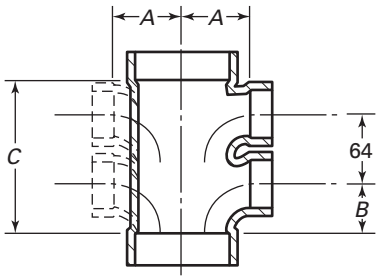


DWV Trap Tees
C × C × SJ

Nominal Size	*K*	*L*	*M*	*KK*	*LL*
$1\frac{1}{4}$	30.2	35.1	50.8	19.1	49.3
$1\frac{1}{2}$	36.6	39.6	58.7	20.6	57.2
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	30.2	39.6	55.6	19.1	53.8
2	49.3	44.5	70.6	28.4	66.5

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) For dimensions of slip joint ends, see Table 49.

Table 21 Dimensions of DWV Double and Quadruple Branch Fittings

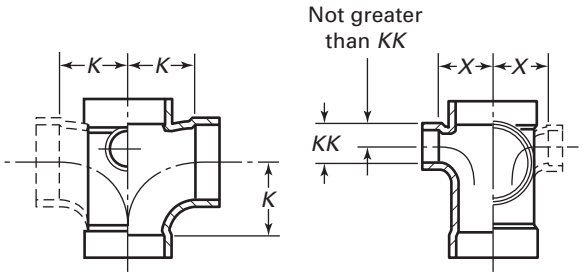


C × C × C × C
C × C × C × C × C × C
DWV Branch Fittings

Nominal Size	*A*	*B*	*C*
3 × 3 with $1\frac{1}{2}$-in. inlets	55.6	39.6	125.5
3 × 3 with $1\frac{1}{4}$-in. inlets	52.3	39.6	125.5
4 × 4 with $1\frac{1}{2}$-in. inlets	66.5	36.6	112.8
4 × 4 with $1\frac{1}{4}$-in. inlets	63.5	36.6	112.8

GENERAL NOTE: Dimensions are in millimeters.

Table 22 Dimensions of Short Design DWV Tees With Side Inlet(s) (90 deg to Main Inlet), Single and Double

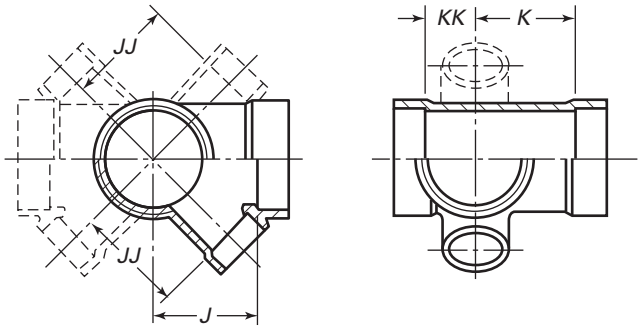


C × C × C With One or Two C Side Inlet(s)
C × C × C × C With One or Two C Side Inlet(s)
DWV Tees — Short Design

Nominal Sizes	*K*	*KK*	*X*
3 × 3 × 3 with 2-in. inlet(s)	74.7	38.1	57.2
3 × 3 × 3 with $1\frac{1}{2}$-in. inlet(s)	74.7	38.1	53.8

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing toward you. The side on which the other inlet appears determines its designation.

Table 23 Dimensions of Short Design DWV Tees With Side Inlet(s) (45 deg to Main Inlet), Single and Double

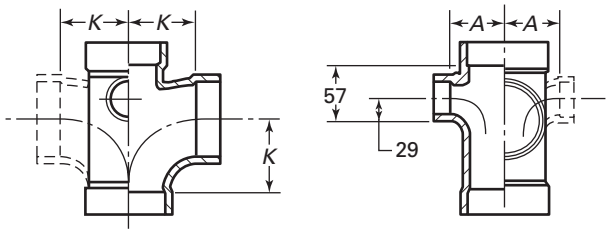


C × C × C With One or Two C Side Inlet(s)
DWV Tees — Short Design

Nominal Size	*K*	*KK*	*J*	*JJ*
3 × 3 × 3 with 2-in. inlet(s)	74.7	39.6	77.7	85.9
3 × 3 × 3 with 1½-in. inlet(s)	74.7	39.6	77.7	79.2

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing toward you. The side on which the other inlet appears determines its designation.

Table 24 Dimensions of Long Design DWV Tees With Side Inlet(s) (90 deg to Main Inlet), Single and Double

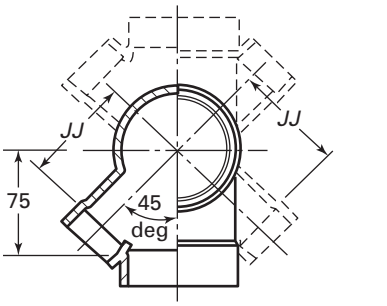


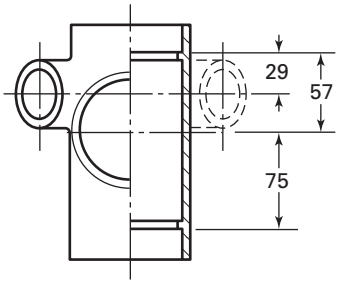
C × C × C With One or Two C Side Inlet(s)
C × C × C × C With One or Two C Side Inlet(s)
DWV Tees — Long Design

Nominal Size	*A*	*K*
3 × 3 × 3 with 2-in. inlet(s)	62.0	74.7
3 × 3 × 3 with 1½-in. inlet(s)	55.6	74.7
3 × 3 × 3 with 1¼-in. inlet(s)	52.3	74.7
4 × 4 × 4 with 2-in. inlet(s)	73.2	98.6
4 × 4 × 4 with 1½-in. inlet(s)	66.5	98.6

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing toward you. The side on which the other inlet appears determines its designation.

Table 25 Dimensions of Long Design DWV Tees With Side Inlet(s) (45 deg to Main Inlet), Single and Double





C × C × C With One or Two C Side Inlet(s)
C × C × C × C With One or Two C Side Inlet(s)
DWV Tees — Long Design

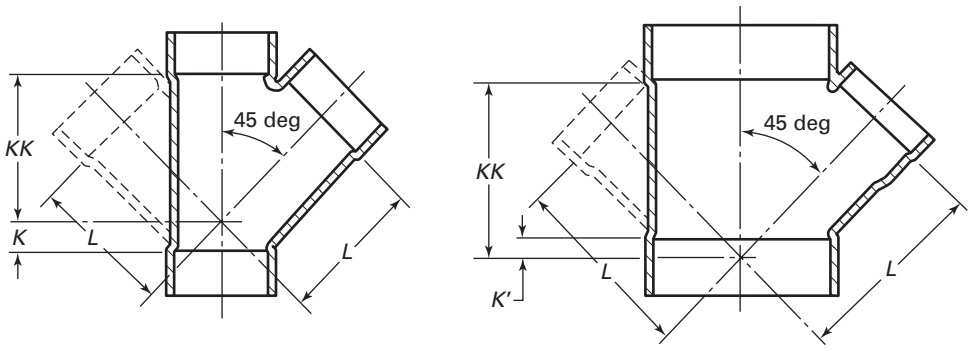
Nominal Size	*JJ*
3 × 3 × 3 with 2-in. inlet(s)	88.9
3 × 3 × 3 with $1\frac{1}{2}$-in. inlet(s)	81.0

GENERAL NOTES:

(a) Dimensions are in millimeters.

(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing toward you. The side on which the other inlet appears determines its designation.

Table 26 Dimensions of Single and Double DWV 45-deg Ys

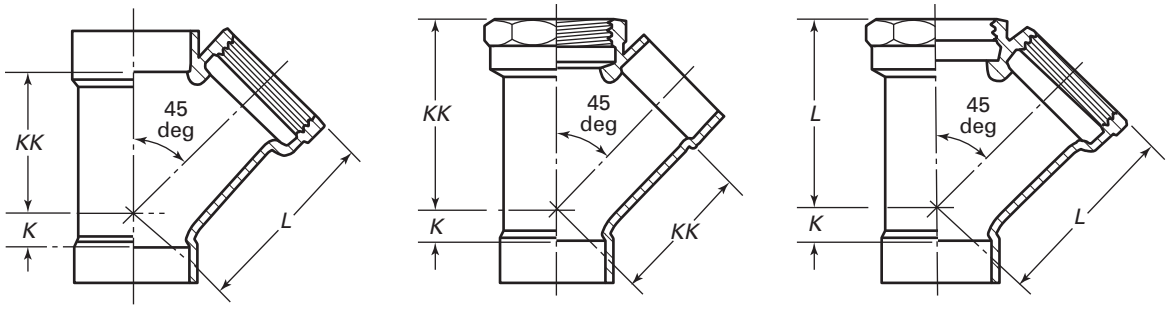


C × C × C
C × C × C × C
DWV 45-deg Ys

Nominal Size	*K*	*K′*	*KK*	*L*
$1\frac{1}{4}$	7.9	. . .	47.8	47.8
$1\frac{1}{2}$	9.7	. . .	55.6	55.6
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	6.4	. . .	50.8	52.3
$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	11.2	. . .	53.8	52.3
$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	6.4	. . .	49.3	49.3
2	9.1	. . .	69.9	69.9
$2 \times 2 \times 1\frac{1}{2}$	5.6	. . .	63.5	65.0
$2 \times 2 \times 1\frac{1}{4}$	1.5	. . .	58.7	62.0
$2 \times 1\frac{1}{2} \times 2$	13.5	. . .	66.5	64.3
$2 \times 1\frac{1}{2} \times 1\frac{1}{2}$	7.1	. . .	55.6	55.6
$2 \times 1\frac{1}{4} \times 1\frac{1}{4}$	1.5	. . .	59.4	65.0
3	20.6	. . .	104.6	104.6
$3 \times 3 \times 2$	3.0	. . .	85.9	88.9
$3 \times 3 \times 1\frac{1}{2}$	. . .	4.8	76.2	82.6
$3 \times 3 \times 1\frac{1}{4}$	. . .	9.7	73.2	77.7
$3 \times 2 \times 3$	2.3	. . .	69.9	69.9
$3 \times 1\frac{1}{2} \times 3$	. . .	9.7	62.0	64.8
$3 \times 1\frac{1}{2} \times 1\frac{1}{2}$	. . .	8.6	55.6	55.6
4	26.9	. . .	136.7	136.7
$4 \times 4 \times 3$	8.6	. . .	117.3	120.7
$4 \times 4 \times 2$	. . .	8.6	98.6	106.4
$4 \times 4 \times 1\frac{1}{2}$	. . .	16.8	90.4	100.1
$4 \times 4 \times 1\frac{1}{4}$	. . .	21.3	85.9	96.8
5	30.2	. . .	165.1	165.1
$5 \times 5 \times 4$	14.2	. . .	146.1	152.4
$5 \times 5 \times 3$	. . .	1.5	130.0	140.5
6	38.1	. . .	195.3	195.3
$6 \times 6 \times 4$	1.5	. . .	158.8	169.9
$6 \times 6 \times 3$	. . .	15.7	142.7	157.2
$6 \times 6 \times 2$	. . .	31.8	124.0	144.5
$6 \times 4 \times 4$	1.5	. . .	134.9	134.9
$6 \times 4 \times 2$	. . .	31.8	100.1	109.5
8	35.1	. . .	258.8	258.8
$8 \times 8 \times 6$	13.5	. . .	223.0	234.2
$8 \times 6 \times 6$	13.5	. . .	196.9	196.9

GENERAL NOTE: Dimensions are in millimeters.

Table 27 Dimensions of DWV 45-deg Ys



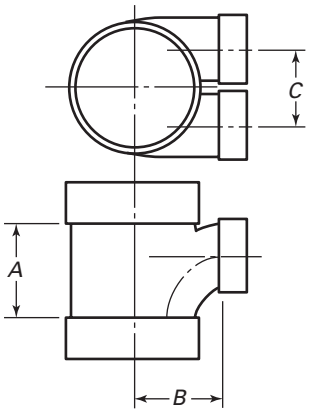
C × C × F C × F × C C × F × F

DWV 45-deg Ys

Nominal Size	*K*	*KK*	*L*
$1\frac{1}{4}$	7.9	47.8	69.9
$1\frac{1}{2}$	9.7	55.6	79.2
2	14.2	69.9	95.3
2 × $1\frac{1}{2}$ × 2	14.2	73.2	95.3
3	20.6	104.6	144.5
4	26.9	136.7	176.3

GENERAL NOTE: Dimensions are in millimeters.

Table 28 Dimensions for DWV Horizontal Twin Branch Tees

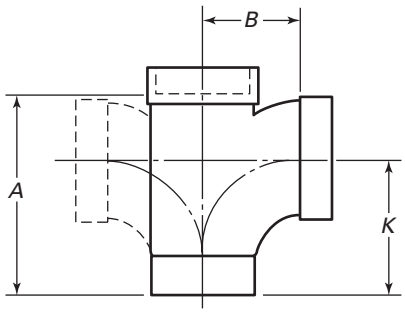


DWV Horizontal Twin Branch Tees
C × C × C × C

Nominal Size	*A*	*B*	Minimum, *C*
3 × 3 × $1\frac{1}{2}$ × $1\frac{1}{2}$	62.0	56.4	47.8
3 × 3 × $1\frac{1}{4}$ × $1\frac{1}{4}$	55.6	55.6	46.5

GENERAL NOTE: Dimensions are in millimeters.

Table 29 Dimensions for DWV Fitting Tees, Single and Double

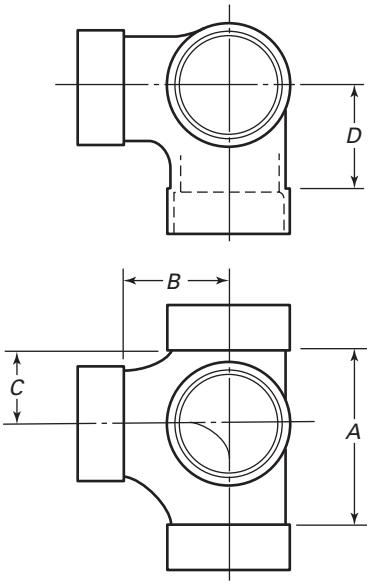


DWV Fitting Tees — Single and Double
FTG × C × C
FTG × C × C × C

Nominal Size	*A*	*B*	*K*
$1\frac{1}{2}$	70.6	35.8	50.0
2	87.6	47.8	63.5
3 × 3 × 2	95.3	60.5	66.5
3 × 3 × $1\frac{1}{2}$	81.0	54.9	56.4
3 × 3 × $1\frac{1}{4}$	69.1	50.8	47.5
3	133.4	73.2	91.9
3 × 2 × 3	125.5	73.2	91.9

GENERAL NOTE: Dimensions are in millimeters.

Table 30 Dimensions for DWV Utility Tees

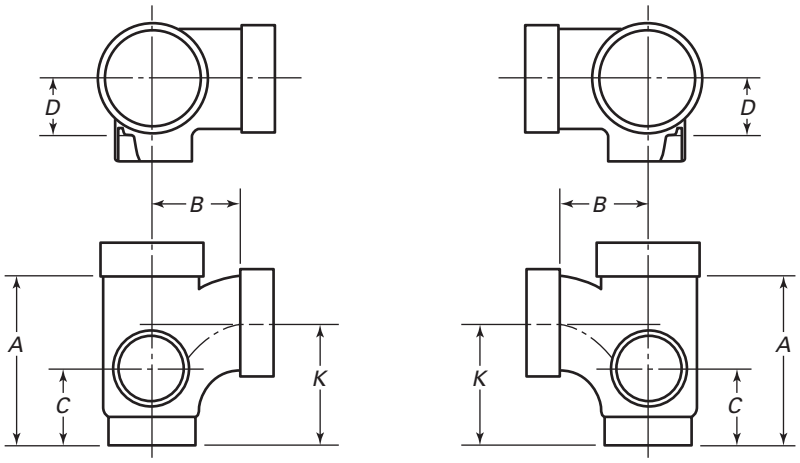


DWV Utility Tees
C × C × C × C

Nominal Size	*A*	*B*	*C*	*D*
1½	57.2	36.6	20.6	36.6
2	81.0	49.3	31.8	49.3
2 × 2 × 1½ × 1½	58.7	42.2	22.4	42.2

GENERAL NOTE: Dimensions are in millimeters.

Table 31 Dimensions for DWV Fitting Tees With Side Inlet Maximum Below Centerline



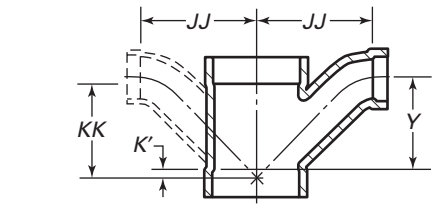
(a) Left Side Inlet
FTG × C × C × C

(b) Right Side Inlet
FTG × C × C × C

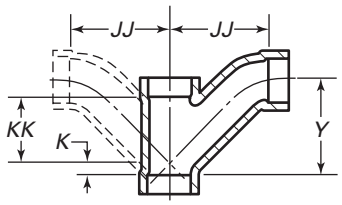
Nominal Size	*A*	*B*	*C*	*D*	*K*
3 × 3 × 3 × 1½	133.4	74.7	54.9	44.5	95.3
3 × 3 × 3 × 2	133.4	74.7	61.2	44.5	95.3

GENERAL NOTE: Dimensions are in millimeters.

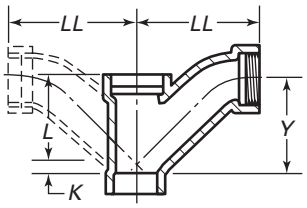
Table 32 Dimensions of DWV Long Turn T–Ys, Single and Double



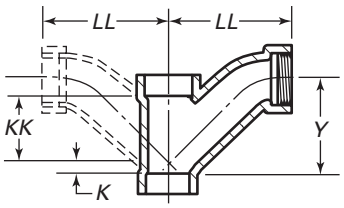
C × C × C
C × C × C × C



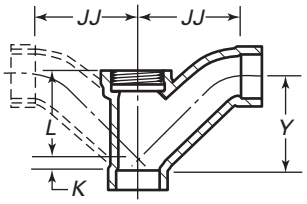
C × C × C
C × C × C × C



C × F × F
C × F × F × F



C × C × F
C × C × F × F

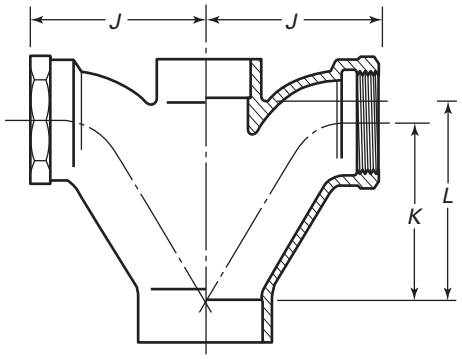


C × F × C
C × F × C × C

Nominal Size	*JJ*	*K*	*K′*	*KK*	*L*	*LL*	*Y*
$1\frac{1}{4}$	63.50	7.87	...	44.45	66.55	100.08	63.50
$1\frac{1}{2}$	76.20	9.65	...	53.85	79.25	96.77	76.20
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	71.37	4.83	...	49.28	76.20	96.77	66.55
2	101.60	14.22	...	66.55	91.95	122.17	101.60
$2 \times 2 \times 1\frac{1}{2}$	87.38	6.35	...	60.45	85.85	112.78	81.03
$2 \times 2 \times 1\frac{1}{4}$	76.20	1.52	...	53.85	...	...	68.33
$2 \times 1\frac{1}{2} \times 2$	101.60	14.22	...	71.37	...	...	101.60
$2 \times 1\frac{1}{4} \times 2$	101.60	12.70	...	61.98	...	...	101.60
3	149.35	20.57	...	98.55	138.18	228.60	149.35
3 × 3 × 2	119.13	2.29	...	82.55	...	...	104.65
$3 \times 3 \times 1\frac{1}{2}$	100.08	...	5.59	73.15	...	...	82.55
$3 \times 3 \times 1\frac{1}{4}$	95.25	...	10.41	70.61	...	...	71.37
3 × 2 × 3	149.35	20.57	...	87.38	...	...	149.35
3 × 2 × 2	114.30	1.52	...	69.85	...	...	101.60
4	196.85	26.92	...	127.00	169.93	228.60	196.85
4 × 4 × 3	142.75	11.18	...	114.30	...	...	130.05
4 × 4 × 2	130.05	...	6.35	98.55	...	...	107.95
$4 \times 4 \times 1\frac{1}{2}$	123.95	...	15.75	88.14	...	...	91.95
5	252.48	31.75	...	165.10	...	...	248.41
5 × 5 × 4	218.95	14.99	...	148.34	...	...	202.44
5 × 5 × 3	184.15	...	1.52	131.83	...	...	156.46
6	299.97	38.86	...	197.61	...	...	295.15
6 × 6 × 5	265.18	22.35	...	180.09	...	...	248.41
6 × 6 × 4	230.89	4.83	...	161.04	...	...	200.91
6 × 6 × 3	195.33	...	12.70	144.53	...	...	155.45

GENERAL NOTE: Dimensions are in millimeters.

Table 33 Dimensions of DWV Double Short T–Y (C × C × F × F)

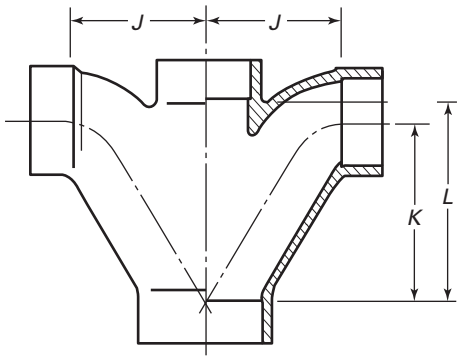


C × C × F × F
DWV Double Short T–Y

Nominal Size	J	K	L
2 × 1½ × 1½ × 1½	77.7	81.0	82.6
2 × 2 × 1½ × 1½	87.4	91.9	93.0
2 × 1½ × 2 × 2	95.3	106.4	106.4
2 × 1½ × 1¼ × 1¼	77.7	81.0	90.4

GENERAL NOTE: Dimensions are in millimeters.

Table 34 Dimensions of DWV Double Short T–Y (C × C × C × C)

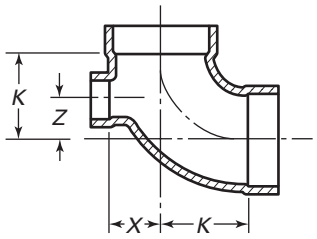


C × C × C × C
DWV Double Short T–Y

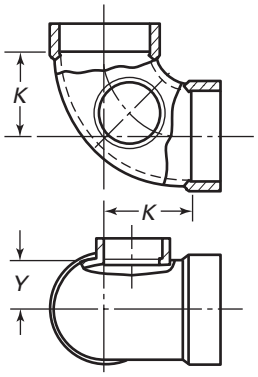
Nominal Size	J	K	L
1½	63.8	82.8	83.6
2	85.9	103.9	101.6
2 × 2 × 1½ × 1½	70.6	91.9	93.5
2 × 1½ × 2 × 2	76.2	106.4	106.4
2 × 1½ × 1½ × 1½	60.5	81.0	82.6
3	112.8	143.8	146.1

GENERAL NOTE: Dimensions are in millimeters.

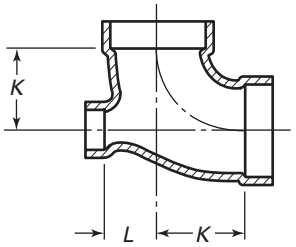
Table 35 Dimensions of DWV Elbow With Inlets



DWV 90-deg Elbow With High Heel Inlet
C × C × C



DWV 90-deg Elbow With Side Inlet
C × C × C

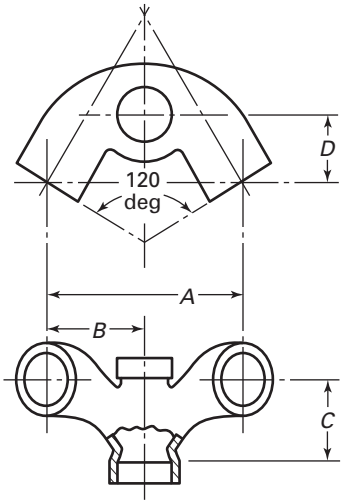


DWV 90-deg Elbow With Low Heel Inlet
C × C × C

Nominal Size	K	X	Y	Z	L
3 × 3 × 2	74.7	42.9	42.9	38.1	32.5
3 × 3 × 1½	74.7	42.9	42.9	38.1	30.2
3 × 3 × 1¼	74.7	42.9	42.9	38.1	28.4
4 × 4 × 2	98.6	53.8	57.2	50.8	47.8
4 × 4 × 1½	98.6	52.3	57.2	50.8	32.5

GENERAL NOTE: Dimensions are in millimeters.

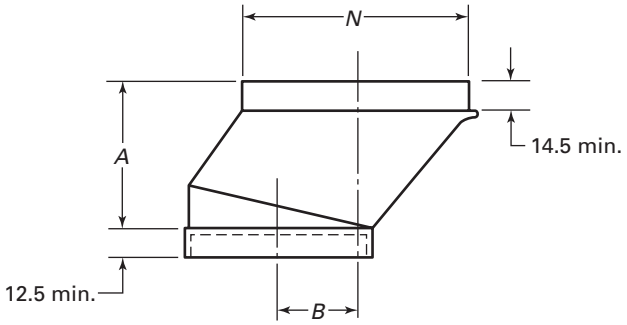
Table 36 Dimensions of DWV Double Branch Sink Fittings



Type	Nominal Size	*A*	*B*	*C*	*D*
C × C × F × F	2 × 1½ × 1½ × 1½	158.8	79.2	57.2	47.8
C × C × C × C	2 × 1½ × 1½ × 1½	158.8	79.2	57.2	47.8

GENERAL NOTE: Dimensions are in millimeters.

Table 37 Dimensions of DWV Closet Offset Fittings

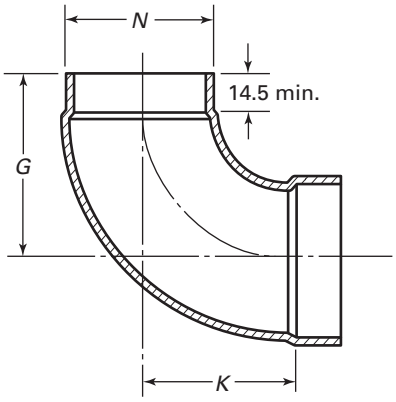


FTG × C

			N	
Nominal Size	*A*	*B*	Minimum	Maximum
4	63.5	49.3	104.686	104.826
4 × 3	63.5	36.6	104.686	104.826

GENERAL NOTE: Dimensions are in millimeters.

Table 38 Dimensions of DWV 90-deg Closet Elbow

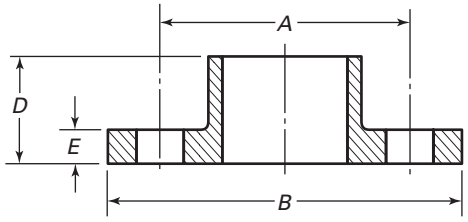


DWV 90-deg Closet Elbow
FTG × C

Nominal Size	K	N		G
		Min.	Max.	
4	98.6	104.686	104.826	112.8
3	74.7	79.286	79.426	88.9
4 × 3	73.2	104.686	104.826	94.5

GENERAL NOTE: Dimensions are in millimeters.

Table 39 Dimensions of Floor Flange Vent Support



Floor Flange Vent Support
[Note (1)]

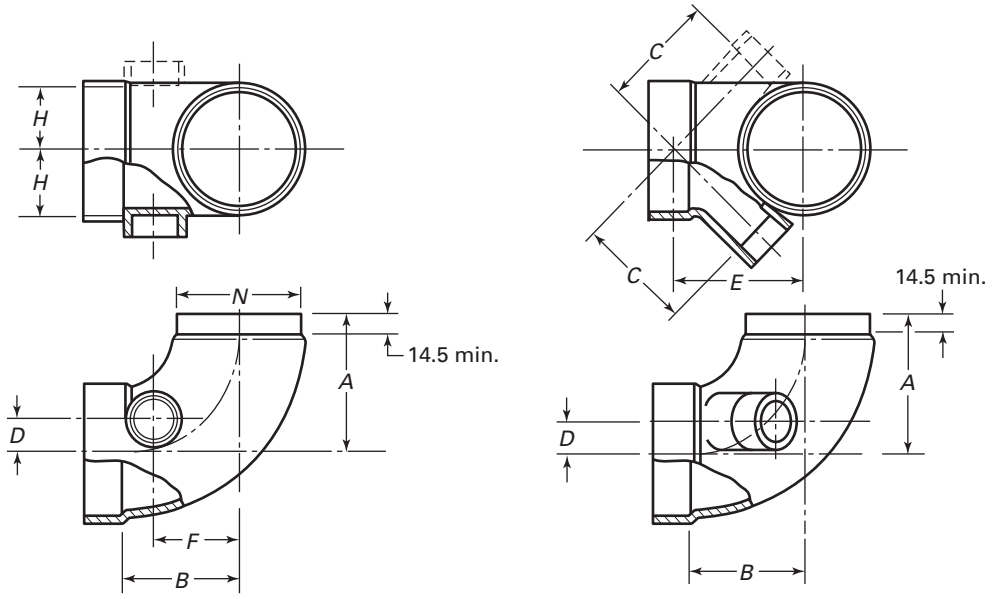
Nominal Size	A	B	D	Minimum, E	Bolt Hole Size	Number of Holes
1¼	66.5	77.7	15.7	4.8	5.6	2
1½	66.5	77.5	17.5	4.8	5.6	2
2	85.9	100.1	19.1	4.8	5.6	2
3	114.3	130.0	23.9	4.8	6.4	2
4	139.7	155.4	30.2	4.8	6.4	2
5	176.3	203.2	36.6	9.7	11.2	4
6	200.2	228.6	42.9	12.7	14.2	4
8	254.0	279.4	53.8	15.7	14.2	4

GENERAL NOTE: Dimensions are in millimeters.

NOTE:

(1) May be round or oval design.

Table 40 Dimensions of DWV Closet Ells With Side Inlet(s) (90 deg and 45 deg) to Main Inlet(s)



FTG × C With One or Two C Side Inlet(s)
DWV — 90-deg Closet Elbows

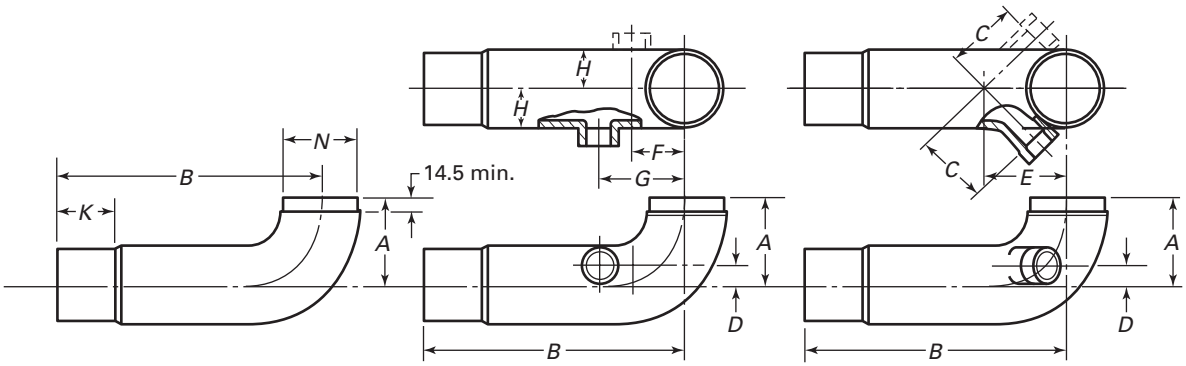
Nominal Size	*A*	*B*	*C*	*D*	*E*	*F*	*H*	*N* Min.	*N* Max.
4 × 3 with $1\frac{1}{2}$-in. inlet(s)	112.78	98.55	91.95	14.22	102.36	71.37	43.69	104.72	104.83
4 × 4 with $1\frac{1}{2}$-in. inlet(s)	112.78	98.55	96.77	25.40	107.19	53.09	53.09	104.72	104.83

GENERAL NOTES:

(a) Dimensions are in millimeters.

(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing up and toward you. The side on which the other inlet appears determines its designation.

Table 41 Dimensions of DWV Closet Ells With or Without Side Inlet(s) (90 deg and 45 deg) to Main Inlet(s)



FTG × FTG

FTG × C With One or Two C Side Inlet(s)

DWV — 90-deg Closet Elbows

Nominal Size	Minimum, A	B	C	D	E	F	G	H	K	N Min.	N Max.
4 × 3	112.8	355.6	. . .	. . .	. . .	. . .	. . .	. . .	80.8	104.724	. . .
4 × 3 with 1½-in. inlet(s)	112.8	355.6	91.9	14.2	102.4	74.7	119.1	43.7	80.8	. . .	104.826
4 × 4	112.8	355.6	. . .	. . .	. . .	. . .	. . .	. . .	80.8	104.724	. . .
4 × 4 with 1½-in. inlet(s)	112.8	355.6	96.8	25.4	107.2	71.4	115.8	53.1	80.8	. . .	104.826

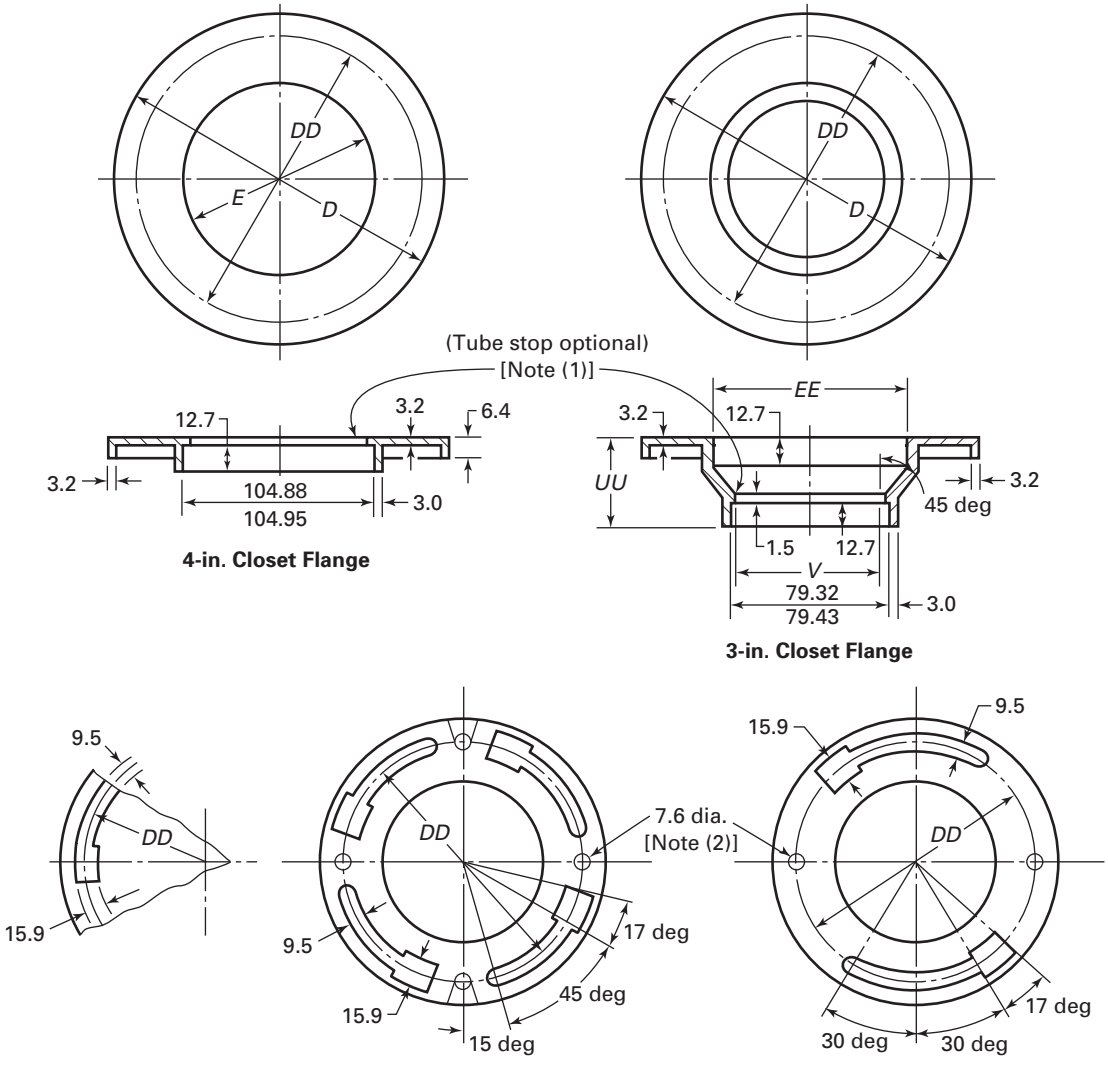
GENERAL NOTES:

(a) Dimensions are in millimeters.

(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing up and toward you. The side on which the other inlet appears determines its designation.

(c) Closet flange attaches to 4-in. end.

Table 42 Dimensions of DWV Closet Flanges



Suggested Slot Arrangements

D	Outside diameter of flange, max.	177.8
DD	Diameter of centerline of slots	152.4
E	Inside diameter of 4-in. flange (if tube stop is used)	100.1
EE	Inside diameter of 3-in. flange	104.6
UU	Length of 3-in. flange	42.9
V	Bore tube stop in 3-in. flange	74.7

GENERAL NOTE: Dimensions are in millimeters.

NOTES:

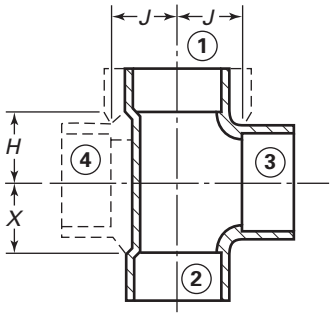
(1) 45-deg angle may be extended to face flange.

(2) Optional:

(a) the addition of 7.6-mm-diameter holes with or without countersink on bolt circle *DD* and/or

(b) two 9.7-mm-wide notches on centerline extending from the outer edge of flange

Table 43 Dimensions of Vent Tees and Vent Double Tees



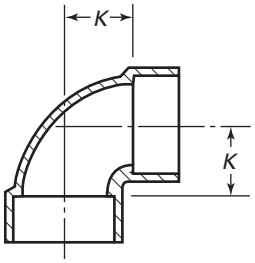
Vent Tees and Vent Double Tees
Vent Increasers With Side Inlets

C × C × C and C × C × C × C
① ② ③ ① ② ③ ④

Nominal Size	*H*	*J*	*X*
$1\frac{1}{4}$	22.1	22.1	22.1
$1\frac{1}{2}$	25.4	25.4	25.4
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	22.1	25.4	22.1
2	31.8	31.8	31.8
$2 \times 2 \times 1\frac{1}{2}$	25.4	31.8	25.4
$2 \times 2 \times 1\frac{1}{4}$	22.1	31.8	22.1
3	44.5	44.5	44.5
3 × 3 × 2	31.8	44.5	31.8
$3 \times 3 \times 1\frac{1}{2}$	25.4	44.5	25.4
$3 \times 3 \times 1\frac{1}{4}$	22.1	44.5	22.1
3 × 4 × 2	30.2	55.6	30.2
$3 \times 4 \times 1\frac{1}{2}$	26.9	53.8	25.4

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) Vent fittings are designed for dry vents only. They are not specified for waste lines. Vent fittings must be marked as follows: VENT ONLY.

Table 44 Dimensions of Vent Elbows

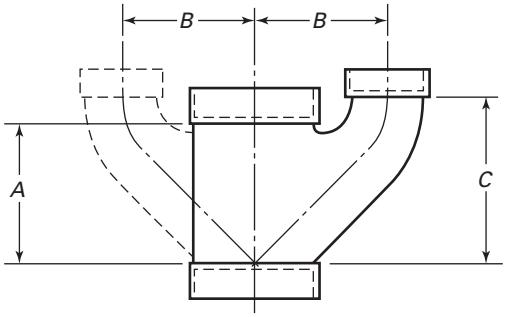


Vent Elbows
C × C

Nominal Size	*K*
$1\frac{1}{4}$	22.1
$1\frac{1}{2}$	25.4
2	31.8
3	44.5

GENERAL NOTES:
(a) Dimensions are in millimeters.
(b) Vent fittings are designed for dry vents only. They are not specified for waste lines. Vent fittings must be marked as follows: VENT ONLY.

Table 45 Dimensions of DWV Stack Upturns, Single and Double

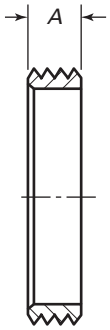


DWV Stack Upturns,
Single and Double
C × C × C and C × C × C × C

Nominal Size	*A*	*B*	*C*
2	82.6	88.9	119.9
$2 \times 2 \times 1\frac{1}{2}$	65.0	79.2	97.5
$2 \times 1\frac{1}{2} \times 1\frac{1}{4}$	60.5	69.9	88.1
3	129.3	95.3	144.5
3 × 3 × 2	87.4	86.6	106.4
$3 \times 3 \times 1\frac{1}{2}$	68.3	80.3	87.4
4 × 4 × 3	127.8	108.0	143.8

GENERAL NOTE: Dimensions are in millimeters.

Table 46 Dimensions of Slip Joint Pieces



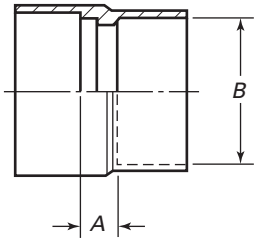
DWV Slip Joint Thread Pieces
C × SJ
[Note (1)]

Nominal Size	*A*
$1\frac{1}{4}$	9.7
$1\frac{1}{2}$	9.7
$1\frac{1}{4} \times 1\frac{1}{2}$	9.7
2	9.7

GENERAL NOTE: Dimensions are in millimeters.

NOTE:
(1) For slip joint threads, see Table 49.

Table 47 Dimensions of Trap Coupling

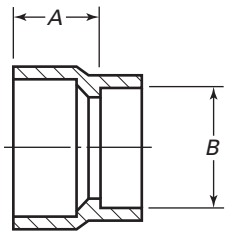


DWV Trap Coupling
C × O.D. Tube

Nominal Size	*A*	*B*
$1\frac{1}{4} \times 1\frac{1}{4}$ O.D.	3.3	31.8
$1\frac{1}{2} \times 1\frac{1}{2}$ O.D.	5.6	38.1
$1\frac{1}{2} \times 1\frac{1}{4}$ O.D.	6.4	31.8
$2 \times 1\frac{1}{2}$ O.D.	10.4	38.1

GENERAL NOTE: Dimensions are in millimeters.

Table 48 Dimensions of Trap Extended Bushings

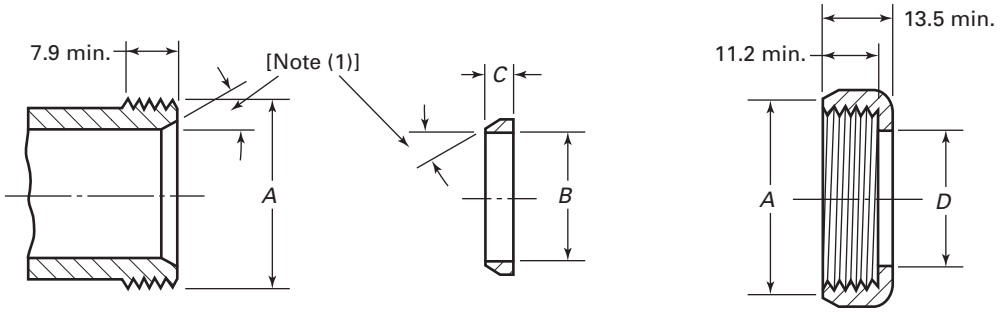


DWV Trap Extended Bushing
FTG × Outside Diameter of Tube (FTG × O.D. Tube)

Nominal Size	*A*	*B*
$1\frac{1}{2} \times 1\frac{1}{4}$ O.D.	19.1	31.8
$1\frac{1}{2} \times 1\frac{1}{2}$ O.D.	19.1	38.1

GENERAL NOTE: Dimensions are in millimeters.

Table 49 Dimensions of Slip Joint Ends



Fitting SJ | **Gasket [Note (2)]** | **Nut [Note (3)]**

DWV Slip Joint Ends

Nominal Size	*A*	*B*	Minimum, *C*	*D*
1¼	1¼ NPSM	32.0	11.7	32.5
1½	1½ NPSM	38.4	4.8	38.9
2	2 NPSM	51.1	4.8	51.6

GENERAL NOTE: Dimensions are in millimeters.

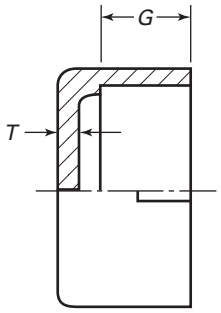
NOTES:

(1) Angles must be equal.

(2) Gasket to be pliable material not subject to aging or drying out.

(3) Nut may be any material specified in section 8, or any other suitable nonferrous alloy.

Table 50 Dimensions of DWV Cap

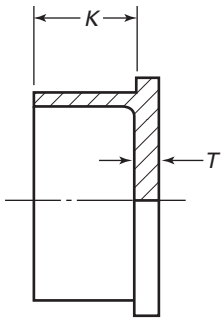


DWV Cap C

Nominal Size	*G*	*T*
1¼	12.7	2.5
1½	14.2	2.5
2	15.7	2.5
3	19.1	3.0
4	25.4	3.0

GENERAL NOTE: Dimensions are in millimeters.

Table 51 Dimensions of DWV Plugs

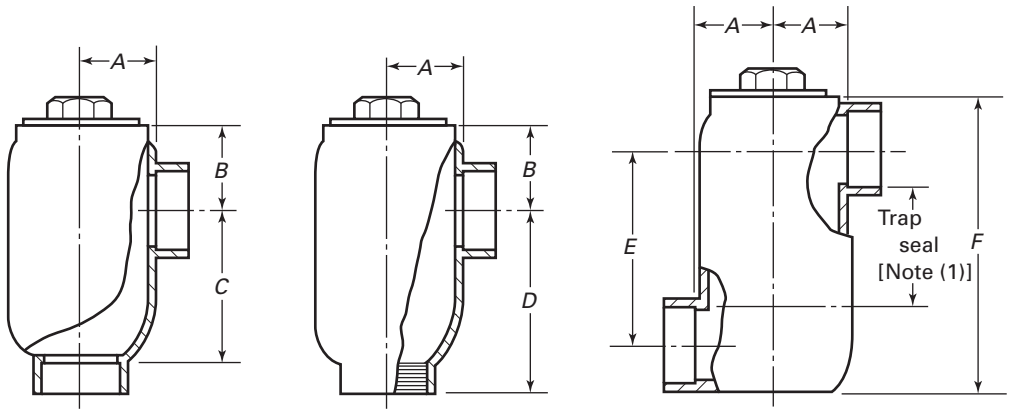


DWV Fitting Plug FTG

Nominal Size	*K*	*T*
1¼	14.2	2.5
1½	15.7	2.5
2	17.5	2.5
3	20.6	3.0

GENERAL NOTE: Dimensions are in millimeters.

Table 52 Dimensions of DWV Drum Traps



C × C C × F C × C

DWV One-Piece Drum Traps

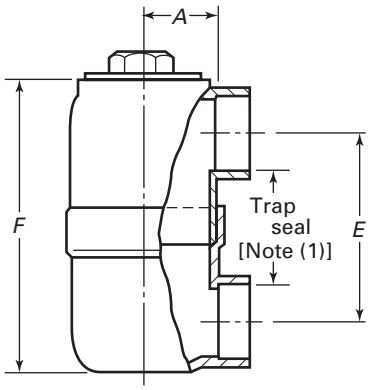
Type	Drum Size	Pipe and Tubing Size	Plug Size	*A*	*B*	*C*	*D*	*E*	Maximum, *F*
C × C	3 × 5	$1\frac{1}{2}$	2	38.1	43.7	75.4	...	...	...
C × F	3 × 5	$1\frac{1}{2}$	2	38.1	43.7	...	81.8	...	...
C × C	3 × 6	$1\frac{1}{2}$	2	38.1	...	...	...	98.6	171.5
C × F	4 × 5	$1\frac{1}{2}$	3	50.8	31.0	...	82.6	...	...
C × C	4 × 5	$1\frac{1}{2}$	3	50.8	31.0	...	...	...	...
C × C	4 × 8	$1\frac{1}{2}$	3	50.8	...	...	...	119.9	203.2
C × F	4 × 5	$1\frac{1}{4}$	3	50.8	31.0	...	82.6	...	...
C × C	4 × 5	$1\frac{1}{4}$	3	50.8	31.0	...	...	...	...

GENERAL NOTE: Dimensions are in millimeters.

NOTE:

(1) Trap seal is 50 mm min.

Table 53 Dimensions of DWV Swivel Drum Traps



C × C
DWV Swivel Drum Traps

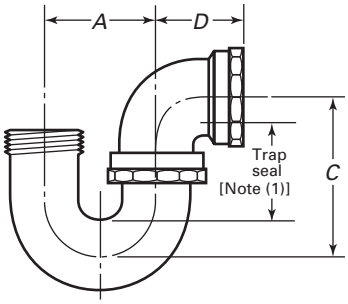
Type	Drum Size	Tube Size	Plug Size	*A*	*E*	Maximum, *F*
C × C	3 × 6	1½	2	38.1	98.6	171.5
C × C	4 × 8	1½	3	50.8	119.9	203.2
C × C	3 × 6	2	2	38.1	93.0	169.2
C × C	4 × 8	2	3	50.8	110.2	197.6

GENERAL NOTE: Dimensions are in millimeters.

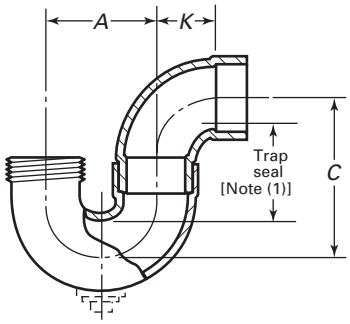
NOTE:

(1) Trap seal is 50 mm min.

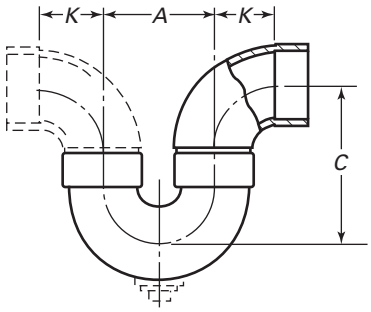
Table 54 Dimensions of DWV Traps



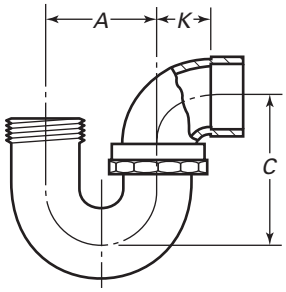
DWV P-Trap With Union Joint
SJ × F



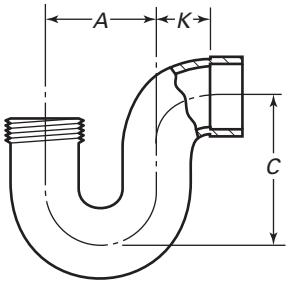
DWV P-Trap With or Without Cleanout
SJ × C



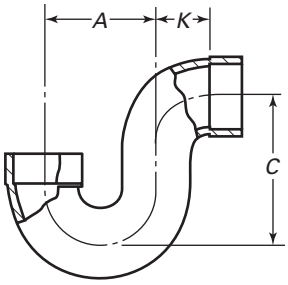
DWV P-Trap or Running Trap With or Without Cleanout
C × C



DWV P-Trap With Union Joint
SJ × C



DWV One-Piece P-Trap
SJ × C



DWV One-Piece Line P-Trap
C × C

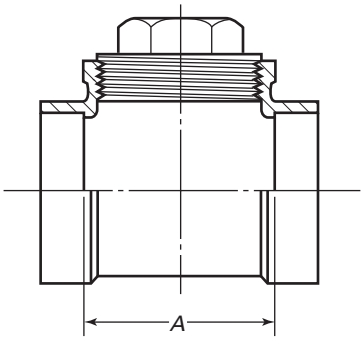
Description	Nominal Size	*A*	*K*	Minimum, *C*	*D*
P-trap SJ × C with or without cleanout	$1\frac{1}{4}$	55.6	30.2	83.3	. . .
P-trap C × C with or without cleanout	$1\frac{1}{2}$	62.0	36.6	89.7	. . .
Running P-trap C × C with or without cleanout	2	74.7	49.3	108.0	. . .
P-trap swivel SJ × C	$1\frac{1}{4}$	60.5	28.4	80.3	49.3
P-trap swivel SJ × F	$1\frac{1}{2}$	66.5	28.4	87.4	49.3
P-trap one-piece SC	2	79.2	37.3	99.3	71.4
P-trap one-piece CC	$1\frac{1}{2}$	62.0	36.6	89.7	. . .

GENERAL NOTE: Dimensions are in millimeters.

NOTE:

(1) Trap seal is 50 mm min. (all traps).

Table 55 Dimensions of DWV Test Tees With Plug

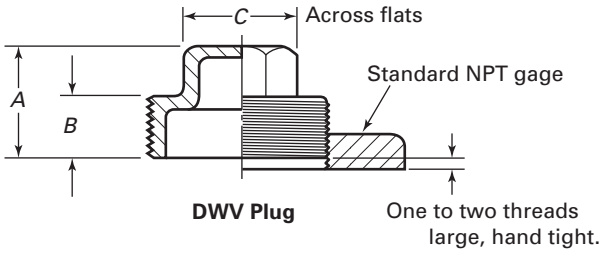


DWV Test Tees With Plug
C × C × F

Nominal Size	*A*
1¼ × 1¼ × 1¼	50.8
1½ × 1½ × 1½	57.2
2 × 2 × 2	69.9
3 × 3 × 3	98.6
4 × 4 × 4	139.7

GENERAL NOTE: Dimensions are in millimeters.

Table 56 Dimensions of DWV Plugs



DWV Plug

One to two threads large, hand tight.

Nominal Size	*A*	*B*	*C*
1¼	22.4	11.2	22.4
1½	25.4	12.7	25.4
2	27.7	13.5	28.4
3	33.3	15.7	35.1
4	35.1	16.8	35.1
5	36.6	17.5	38.1
6	38.9	18.3	38.1
8	44.5	19.1	44.5

GENERAL NOTE: Dimensions are in millimeters.

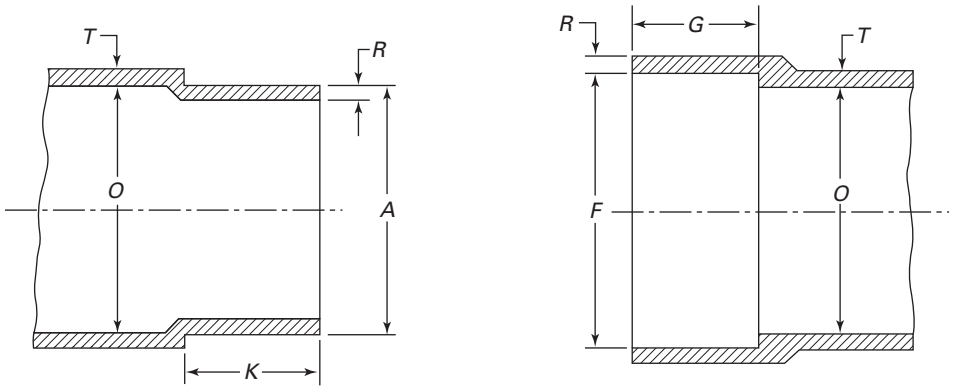
MANDATORY APPENDIX I
U.S. CUSTOMARY TABLES

This Appendix provides tables of the standard inch dimensions for fittings (Tables I-1 through I-56).

Table I-1 Inspection Tolerance Table

Nominal Size	± in.
1¼, 1½, and 2	0.08
3	0.11
4 and 5	0.12
6 and 8	0.16

Table I-2 Dimensions of Solder Joint Ends — DWV



(a) Male End (FTG) (b) Female End (C)

Nominal Size [Note (1)]	Male End			Female End			Metal Thickness [Note (4)]		Minimum Inside Diameter of Fitting, *O*
	Outside Diameter, *A* [Note (2)]		Minimum Length, *K* [Note (3)]	Inside Diameter, *F* [Note (2)]		Minimum Depth, *G*	Body, *T*	Joint, *R*	
	Min.	Max.		Min.	Max.				
$1\frac{1}{4}$	1.372	1.377	0.56	1.378	1.382	0.50	0.10	0.07	1.29
$1\frac{1}{2}$	1.621	1.627	0.62	1.628	1.633	0.56	0.10	0.08	1.53
2	2.121	2.127	0.69	2.128	2.133	0.62	0.10	0.09	2.01
3	3.121	3.127	0.81	3.128	3.133	0.75	0.12	0.10	2.98
4	4.121	4.127	1.06	4.128	4.133	1.00	0.12	0.12	3.93
5	5.121	5.127	1.31	5.128	5.133	1.25	0.19	0.19	4.91
6	6.121	6.127	1.62	6.128	6.133	1.50	0.19	0.19	5.88
8	8.119	8.127	2.12	8.128	8.133	2.00	0.22	0.22	7.78

GENERAL NOTES:

(a) Dimensions are in inches.

(b) The sketches and designs of fittings are illustrative only. The dimensions herein shall govern in all cases.

NOTES:

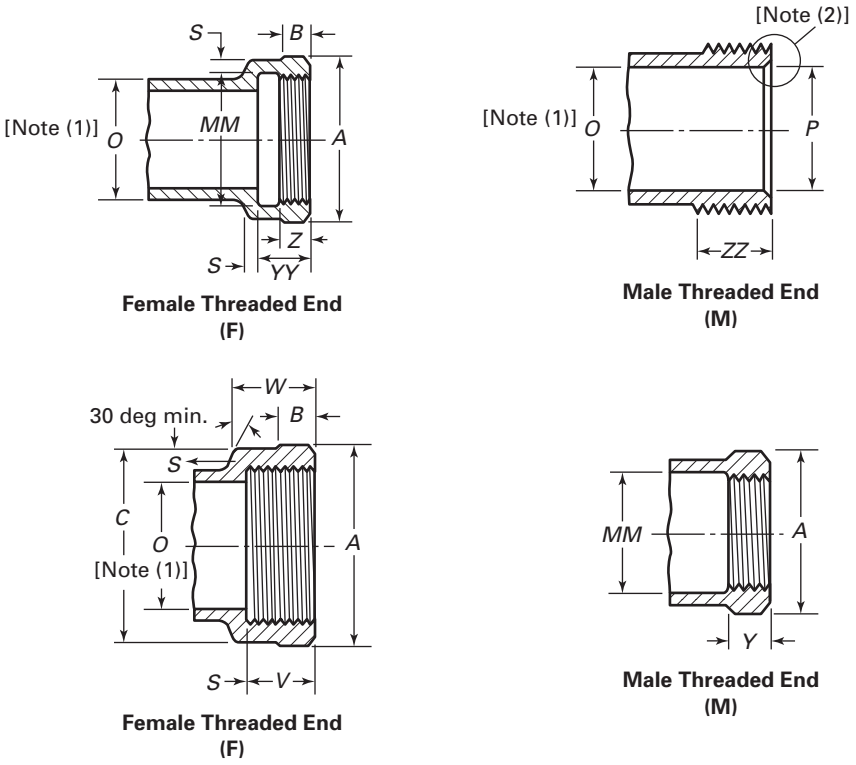
(1) For size designation of fitting, see section 6.

(2) For ovality, see para. 10.3.

(3) *K* dimensions of 0.44, 0.50, and 0.56, and *G* dimensions of 0.38, 0.44, and 0.50, respectively for $1\frac{1}{4}$-in., $1\frac{1}{2}$-in., and 2-in. sizes are sound and acceptable from an engineering standpoint. However, the cup depths specified in Table I-2 are to provide greater facility in making installations.

(4) For metal thickness tolerance, see section 9.

Table I-3 Dimensions of Threaded Ends — DWV



Nominal Thread Size [Note (3)]	Minimum Dia. of Band or Across Flats of Polygon, *A*	Minimum Band Length, *B*	Minimum Dia. of Body Over Thread, *C*	Minimum Dia. of Recess, *MM* [Note (4)]	Minimum Depth of Full Thread, *V*	Minimum, *W*	Minimum Length of Thread, *Y*	Minimum End To Shoulder, *YY* ±0.06 [Note (4)]	Minimum Thread End Wall, *S* [Note (5)]	Maximum Thread End Bore, *P* [Note (4)]	Minimum Length of Effective Thread, *ZZ*
1¼	1.91	0.31	1.90	1.66	0.71	1.00	0.42	0.70	0.120	1.31	0.71
1½	2.17	0.34	2.17	1.91	0.72	1.00	0.42	0.72	0.130	1.55	0.72
2	2.69	0.41	2.68	2.38	0.76	1.03	0.44	0.75	0.150	2.03	0.76
3	3.88	0.55	3.88	3.50	1.20	1.46	0.77	1.20	0.190	3.05	1.20
4	4.94	0.66	4.94	4.50	1.30	1.53	0.84	1.30	0.220	4.05	1.30
5	6.12	0.78	6.12	5.56	1.41	1.65	0.94	1.41	0.280	4.98	1.41
6	7.30	0.88	7.30	6.62	1.51	1.68	0.96	1.50	0.340	6.03	1.51
8	9.38	1.12	9.37	8.62	1.71	1.75	1.06	1.70	0.375	7.95	1.71

GENERAL NOTES:

(a) Dimensions are in inches.

(b) For threads of threaded ends, see section 11.

NOTES:

(1) For inside diameter of fitting, see Table I-2.

(2) 1¼, 1½, and 2 male threaded ends may have inside chamfer for slip nut connections.

(3) Thread size is American National Standard Pipe Threads, General Purpose (Inch), ANSI/ASME B1.20.1.

(4) Dimensions computed using formula $E_1 - h - 2T$.

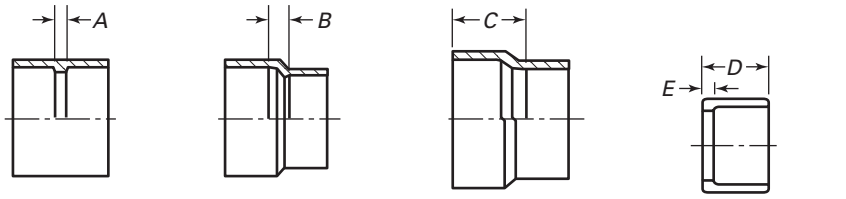
E_1 = thread pitch diameter from ANSI/ASME B1.20.1

h = height of thread from ANSI/ASME B1.20.1

T = metal thickness from Table I-2

(5) For initial thickness tolerance, see section 9.

Table I-4 Dimensions for DWV Couplings, Reducers, Extended Bushings, and Flush Bushings

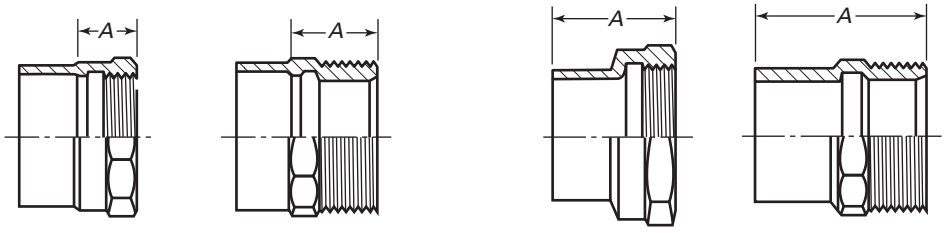


DWV Coupling C × C | DWV Reducer C × C | DWV Extended Bushing FTG × C | DWV Flush Bushing FTG × C

Nominal Size	Coupling, *A*	Reducer, *B*	Extended Bushing, *C*	Flush Bushing	
				D	*E*
1¼	0.12	...	...	...	...
1½	0.12	...	...	...	...
1½ × 1¼	...	0.25	0.75	0.62	0.12
2	0.12	...	...	...	...
2 × 1½	...	0.38	0.91	0.69	0.13
2 × 1¼	...	0.44	0.94	0.69	0.19
3	0.19	...	...	...	...
3 × 2	...	0.75	1.38	0.81	0.19
3 × 1½	...	0.94	1.31	0.81	0.25
3 × 1¼	...	0.94	1.31	...	...
4	0.19	...	...	...	...
4 × 3	...	0.34	1.62	1.06	0.31
4 × 2	...	0.50	1.75	...	...
4 × 1½	...	1.50	...	...	...
5	0.25	...	...	...	...
5 × 4	...	0.56	1.56	...	...
5 × 3	...	0.88	1.88	...	...
6	0.25	...	...	...	...
6 × 5	...	0.53	2.94	...	...
8	0.38	...	...	...	...
8 × 6	...	1.38	...	...	...

GENERAL NOTE: Dimensions are in inches.

Table I-5 Dimensions of DWV Adapters

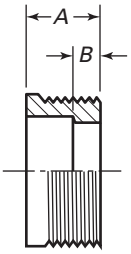


DWV Adapters

Nominal Size	C × F, *A*	C × M, *A*	FTG × F, *A*	FTG × M, *A*
$1\frac{1}{4}$	0.81	0.94	1.47	1.94
$1\frac{1}{4} \times 2$	0.94	1.31	...	...
$1\frac{1}{4} \times 1\frac{1}{2}$	0.81	1.12	...	...
$1\frac{1}{2}$	0.81	0.94	1.53	2.06
$1\frac{1}{2} \times 2$	0.88	1.25	...	...
$1\frac{1}{2} \times 1\frac{1}{4}$	0.81	1.06	...	...
2	0.88	0.94	1.63	2.38
2 × 3	1.88	...	...	...
$2 \times 1\frac{1}{2}$	0.88	1.06	...	...
$2 \times 1\frac{1}{4}$	0.88	1.06	...	...
3	1.50	1.56	2.38	3.00
3 × 4	2.25	...	...	...
3 × 2	1.56	1.44	...	...
4	1.66	1.62	2.81	3.62
4 × 3	1.69	...	...	...
5	1.94	1.75	...	...
6	2.19	2.00	3.81	...
8	2.62	3.38	4.38	...

GENERAL NOTE: Dimensions are in inches.

Table I-6 Dimensions of DWV Short Adapters

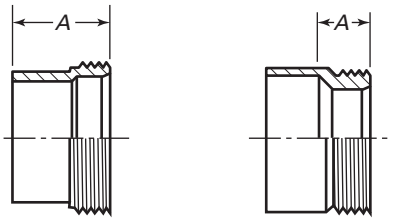


C × M
DWV Short Adapters

	C × M	
Nominal Size	*A*	*B*
1¼	1.00	0.50
1½	1.00	0.44
1¼ × 1½	1.00	0.50
2	1.12	0.50
1½ × 2	1.19	0.62

GENERAL NOTE: Dimensions are in inches.

Table I-7 Dimensions of DWV Trap Adapters

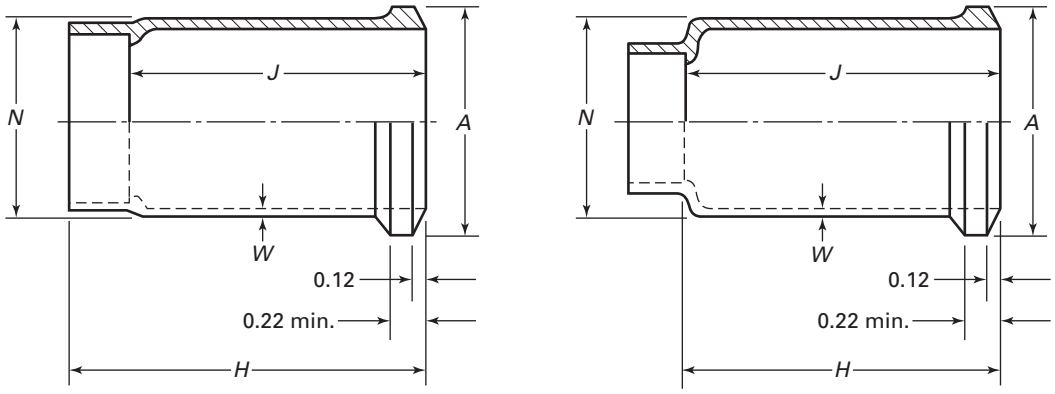


FTG × SJ **C × SJ**
DWV Trap Adapters

Nominal Size	FTG × SJ, *A*	C × SJ, *A*
1¼	1.19	0.62
1½	1.25	0.69
1½ × 1¼	. . .	0.69
2	. . .	0.69
2 × 1½	. . .	0.69

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For dimensions of slip joint ends, see Table I-49.

Table I-8 Dimensions of C to Soil Pipe Adapter for Joining to Extra Heavy Soil Pipe



Straight Sizes **Reducing Sizes**

DWV Soil Pipe Adapter — C × Spigot

Nominal Size Soil Pipe, C × Spigot [Note (1)]	Diameter of Bead, *A*		Body Wall, *W*	Body Outside Diameter [Note (2)], *N* ±0.09	Body Length [Note (3)], *H* ±0.06	Laying Length, *J*
	Max.	Min.				
2 × 2	2.75	2.69	0.10	2.38	2.50	2.50
1½ × 2	2.75	2.69	0.10	2.38	3.25	2.31
1¼ × 2	2.75	2.69	0.10	2.38	3.25	3.31
3 × 3	3.88	3.81	0.12	3.50	2.75	2.75
2 × 3	3.88	3.81	0.12	3.50	3.50	3.56
1½ × 3	3.88	3.81	0.12	3.50	3.50	3.56
4 × 4	4.88	4.81	0.12	4.50	3.00	3.00
3 × 4	4.88	4.81	0.12	4.50	3.75	3.81
2 × 4	4.88	4.81	0.12	4.50	3.75	3.88
1½ × 4	4.88	4.81	0.12	4.50	3.75	3.88
5 × 5	5.88	5.81	0.19	5.50	3.00	3.00
6 × 6	6.88	6.81	0.22	6.50	3.00	3.00

GENERAL NOTE: Dimensions are taken in inches.

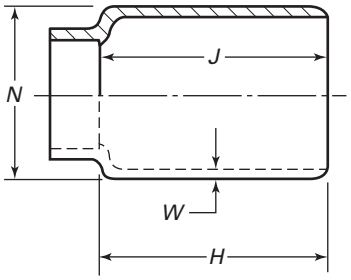
NOTES:

(1) Dimensions given are for extra heavy weight soil pipe. Refer to ASTM A74. For service weight, *A* and *N* may be reduced as shown in Table 2 of ASTM A74. Service weight adapters should be marked “SW” or “SERVICE WEIGHT.”

(2) *N* is taken from outside diameter of XH soil pipe.

(3) *H* body lengths are based on “telescoping lengths of XH soil pipe hubs.”

Table I-9 Dimensions of C to Soil Pipe Adapter — Plain End for Joining to Extra Heavy Soil Pipe



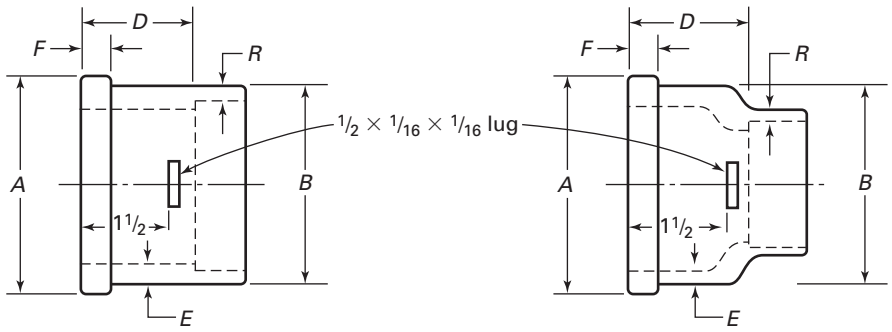
C × Soil Pipe
DWV Soil Pipe Adapters — Plain End
[Note (1)]

Nominal Size	Body Length, *H* ±0.06	Body Outside Diameter, *N* ±0.09	Body Wall, *W*	Laying Length, *J*
2 × 2	2.50	2.38	0.10	2.50
$1\frac{1}{4}$ × 2	2.50	2.38	0.10	2.56
$1\frac{1}{2}$ × 2	2.50	2.38	0.10	2.56
3 × 3	2.75	3.50	0.12	2.75
2 × 3	2.75	3.50	0.12	2.81
3 × 4	3.00	4.50	0.12	3.06

GENERAL NOTE: Dimensions are in inches.

NOTE:
(1) For use with elastomer gasket.

Table I-10 Dimensions of C × No-Hub Soil Pipe Adapter



DWV Soil Pipe Adapter — C × No-Hub
[Note (1)]

Nominal Size C × No-Hub	Diameter of Bead, *A* ±0.06	Outside Diameter of Body, *B* ±0.06	Laying Length, *D*	Metal Thickness [Note (2)]		Minimum Width Bead, *F* +0.13 −0.00
				Body, *E*	Joint, *R*	
2	2.38	2.31	1.22	0.100	0.090	0.25
1½ × 2	2.38	2.31	1.25	0.100	0.078	0.25
1¼ × 2	2.38	2.31	1.28	0.100	0.072	0.25
3	3.41	3.34	1.22	0.120	0.103	0.25
2 × 3	3.41	3.34	1.25	0.120	0.090	0.25
1½ × 3	3.41	3.34	1.28	0.120	0.078	0.25
4	4.44	4.38	1.22	0.120	0.120	0.31
3 × 4	4.44	4.38	1.25	0.120	0.103	0.31

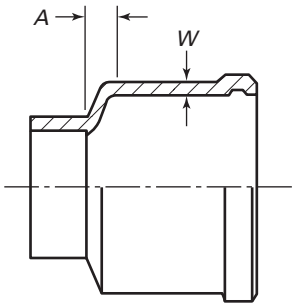
GENERAL NOTE: Dimensions are in inches.

NOTES:

(1) For use with stainless steel clamp and elastomer gasket.

(2) For metal thickness tolerance, see section 9.

Table I-11 Dimensions of C × Hub Soil Pipe Adapter

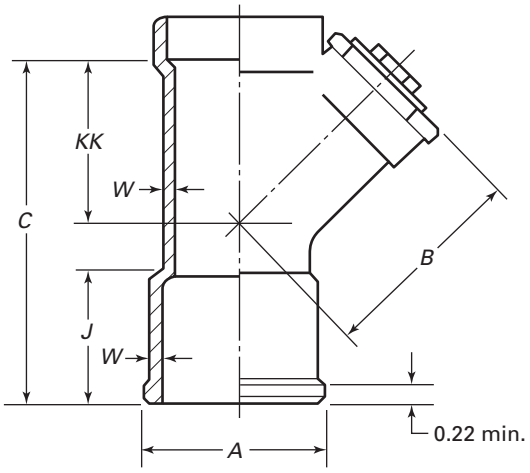


DWV Soil Pipe Adapter
C × Hub

Nominal Size	*A*	*W*
3	0.38	0.12
3 × 4	0.44	0.12
4	0.19	0.12

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For hub dimensions, see ASTM A74.

Table I-12 Dimensions of DWV 45-deg Y With Cleanout — Soil Pipe (Spigot) × C × Cleanout

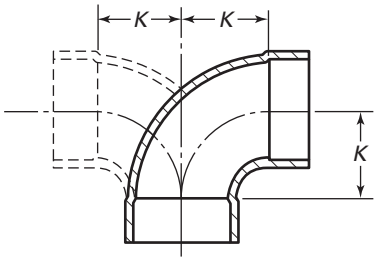


DWV 45-deg Y With Cleanout

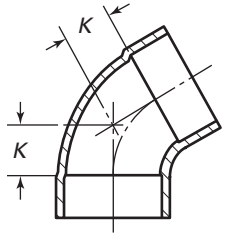
Nominal Size	*A*		Minimum, *B*	*C*	*J*	*KK*	*W*
	Max.	Min.					
4 × 3 × 3	4.83	4.81	5.12	8.50	3.00	4.12	0.12

GENERAL NOTE: Dimensions are in inches.

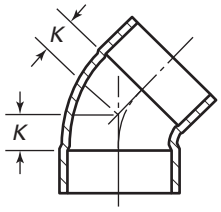
Table I-13 Dimensions of DWV Elbows and Double Elbows — C × C



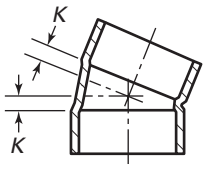
DWV 90-deg Elbow
C × C and C × C × C



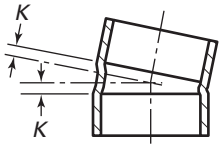
DWV 60-deg Elbow
C × C



DWV 45-deg Elbow
C × C



DWV $22\frac{1}{2}$-deg Elbow
C × C

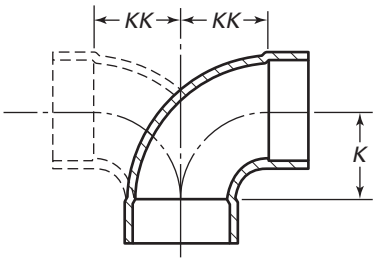


DWV $11\frac{1}{4}$-deg Elbow
C × C

Angle	Dimension	Nominal Size							
		$1\frac{1}{4}$	$1\frac{1}{2}$	2	3	4	5	6	8
DWV 90-deg elbow, C × C	*K*	1.19	1.44	1.94	2.94	3.88	4.88	5.81	7.81
DWV 60-deg elbow, C × C	*K*	0.69	0.81	1.12	1.69	2.25	2.88	3.50	4.62
DWV 45-deg elbow, C × C	*K*	0.50	0.56	0.81	1.19	1.62	2.06	2.50	3.31
DWV $22\frac{1}{2}$-deg elbow, C × C	*K*	0.19	0.25	0.38	0.56	0.75	0.94	1.12	1.50
DWV $11\frac{1}{4}$-deg elbow, C × C	*K*	0.12	0.12	0.19	0.25	0.31	0.41	0.50	0.66

GENERAL NOTE: Dimensions are in inches.

Table I-14 Dimensions of Reducing DWV Single and Double Elbows — C × C

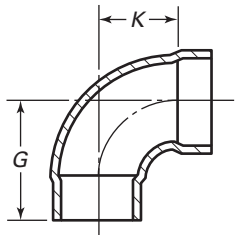


DWV 90-deg Elbow, C × C
DWV Double Elbow, C × C × C

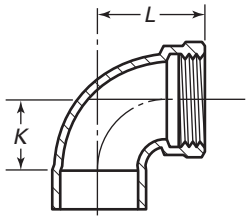
Angle	Dimension	Nominal Size C × C or C × C × C			
		1½ × 1¼	2 × 1½	2 × 1¼	4 × 3
DWV 90-deg reducing elbow, C × C	*K*	1.19	1.44	1.19	2.81
	KK	1.31	1.69	1.56	3.00

GENERAL NOTE: Dimensions are in inches.

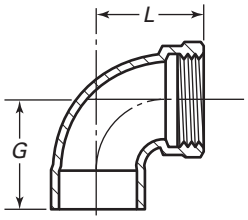
Table I-15 Dimensions of DWV Elbows



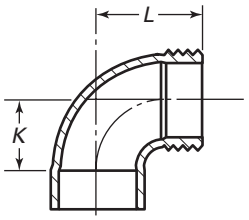
DWV 90-deg Elbow
FTG × C



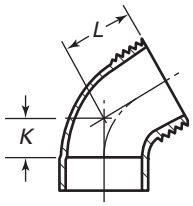
DWV 90-deg Elbow
C × F



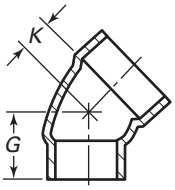
DWV 90-deg Elbow
FTG × F



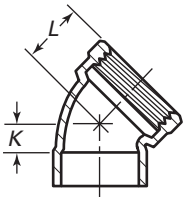
DWV 90-deg Elbow
C × M



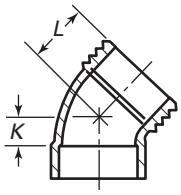
DWV 60-deg Elbow
C × M



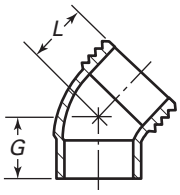
DWV 45-deg Elbow
FTG × C



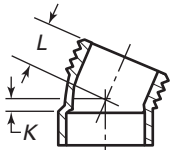
DWV 45-deg Elbow
C × F



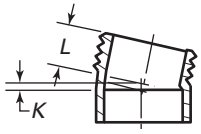
DWV 45-deg Elbow
C × M



DWV 45-deg Elbow
FTG × M



DWV $22^1/_2$-deg Elbow
C × M



DWV $11^1/_4$-deg Elbow
C × M

Angle	Dimensions	Nominal Size				
		$1^1/_4$	$1^1/_2$	2	3	4
DWV 90-deg elbow, FTG × C	*K*	1.19	1.44	1.94	2.94	3.88
	G	1.75	2.12	2.69	3.75	4.88
DWV 90-deg elbow, C × F	*K*	1.19	1.44	1.94	2.94	3.88
	L	1.88	2.12	2.69	3.94	4.94
DWV 90-deg elbow, FTG × F	*G*	1.75	2.06	2.69	3.75	4.81
	L	1.88	2.12	2.69	3.94	5.00
DWV 90-deg elbow, C × M	*K*	1.19	1.44	1.94	2.94	3.88
	L	1.88	2.12	2.81	3.94	4.94
DWV 45-deg elbow, FTG × C	*K*	0.50	0.56	0.81	1.19	1.62
	G	1.06	1.19	1.50	2.00	2.69

GENERAL NOTES:
(a) Dimensions are in inches.
(b) See Table I-16 for reducing sizes.
(c) See Table I-17 for continuation of dimensions.

Table I-16 Dimensions of DWV Reducing Elbows

Nominal Size	DWV 90-deg Elbow, C × F		DWV 90-deg Elbow, C × M	
	K	*L*	*K*	*L*
$1\frac{1}{2} \times 1\frac{1}{4}$	1.31	2.00	1.31	1.88

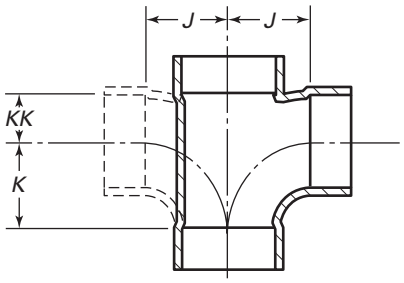
GENERAL NOTES:
(a) Dimensions are in inches.
(b) Refer to illustrations for Table I-15.

Table I-17 Dimensions of DWV Elbows

Angle	Dimensions	Nominal Size		
		$1\frac{1}{4}$	$1\frac{1}{2}$	2
DWV 60-deg elbow, C × M	*K*	0.66	0.81	1.09
	L	1.28	1.50	1.84
DWV 45-deg elbow, C × F	*K*	0.30	0.36	0.75
	L	1.28	1.38	1.66
DWV 45-deg elbow, C × M	*K*	0.50	0.56	0.75
	L	1.19	1.31	1.33
DWV 45-deg elbow, FTG × M	*L*	1.06	1.25	1.33
	G	1.03	1.19	1.30
DWV $22\frac{1}{2}$-deg elbow, C × M	*K*	0.19	0.25	0.34
	L	0.81	0.94	1.09
DWV $11\frac{1}{4}$-deg elbow, C × M	*K*	0.12	0.12	0.19
	L	0.75	0.81	0.94

GENERAL NOTES:
(a) Dimensions are in inches.
(b) Refer to illustrations for Table I-15.

Table I-18 Dimensions of DWV Tees and Double Tees

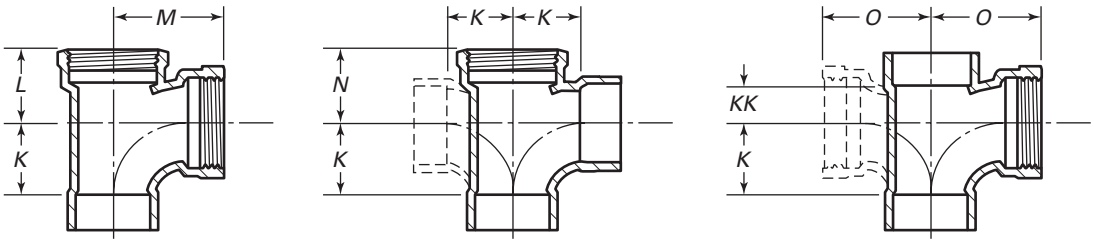


DWV Tees
C × C × C
C × C × C × C

Nominal Size	*J*	*K*	*KK*
1¼	1.19	1.19	0.69
1½	1.44	1.44	0.81
1½ × 1½ × 1¼	1.31	1.19	0.69
1½ × 1¼ × 1½	1.44	1.44	0.81
1½ × 1¼ × 1¼	1.31	1.19	0.75
2	1.94	1.94	1.00
2 × 2 × 1½	1.69	1.44	0.81
2 × 2 × 1¼	1.56	1.19	0.69
2 × 1½ × 2	1.94	1.94	1.00
2 × 1½ × 1½	1.69	1.44	0.81
2 × 1½ × 1¼	1.69	1.44	0.75
3	2.94	2.94	1.50
3 × 3 × 2	2.44	1.94	1.00
3 × 3 × 1½	2.19	1.44	0.81
3 × 3 × 1¼	2.06	1.19	0.69
3 × 2 × 3	2.94	2.94	1.28
3 × 2 × 2	2.44	1.94	0.97
3 × 2 × 1½	2.81	1.44	0.84
3 × 1½ × 3	2.94	2.94	1.25
3 × 1½ × 1½	2.19	1.44	0.69
4	3.88	3.88	2.06
4 × 4 × 3	3.44	2.94	1.50
4 × 4 × 2	2.88	1.94	1.00
4 × 4 × 1½	2.62	1.44	0.81
4 × 4 × 1¼	2.150	1.19	0.69
4 × 2 × 4	3.88	3.88	1.25
5	4.88	4.88	2.31
5 × 5 × 4	4.38	3.88	1.94
6	5.81	5.81	2.75
6 × 6 × 4	4.88	3.88	1.94
6 × 4 × 4	4.81	3.88	1.50
8	7.81	7.81	3.44
8 × 8 × 6	6.69	5.81	2.69
8 × 6 × 6	6.75	5.81	2.31

GENERAL NOTE: Dimensions are in inches.

Table I-19 Dimensions of DWV Tees and Double Tees



C × F × F

C × F × C
C × F × C × C

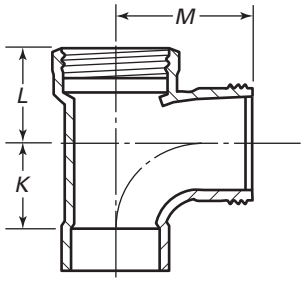
C × C × F
C × C × F × F

DWV Tees and Double Tees

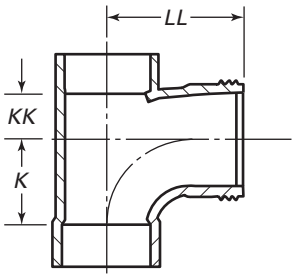
Nominal Size	*K*	*L*	*M*	*N*	*O*	*KK*
1¼	1.19	1.38	1.88	1.38	1.88	0.69
1½	1.44	1.56	2.19	1.50	2.12	0.81
1½ × 1½ × 1¼	1.19	1.56	2.19	...	2.00	0.69
1½ × 1¼ × 1½	1.44	1.56	2.19	...	2.12	0.81
2	1.94	1.75	2.69	1.75	2.69	1.00
2 × 2 × 1½	1.44	1.75	2.38	...	2.38	0.81
2 × 2 × 1¼	1.19	1.75	2.25	...	2.25	0.69
2 × 1½ × 1½	1.44	1.56	2.38	...	2.38	0.88
2 × 1½ × 2	1.94	...	...	1.75	...	...
3	2.94	2.69	3.94	2.50	3.94	1.50
3 × 3 × 2	1.94	...	...	...	3.19	1.00
3 × 3 × 1½	1.44	...	...	...	2.88	0.81
3 × 3 × 1¼	1.19	...	...	...	2.75	0.69
4	3.88	3.31	4.94	3.31	4.94	1.94
4 × 4 × 3	2.94	...	...	...	4.44	1.50
4 × 4 × 2	1.94	...	...	...	3.62	1.00
4 × 4 × 1½	1.44	...	...	...	3.31	0.81
4 × 4 × 1¼	1.19	...	...	...	3.19	0.69

GENERAL NOTE: Dimensions are in inches.

Table I-20 Dimensions of DWV Trap Tees



DWV Trap Tees
C × F × SJ

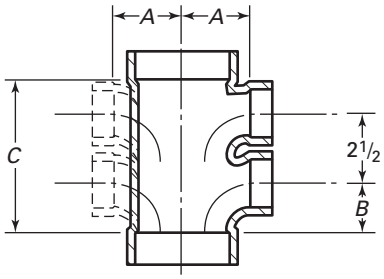


DWV Trap Tees
C × C × SJ

Nominal Size	*K*	*L*	*M*	*KK*	*LL*
$1\frac{1}{4}$	1.19	1.38	2.00	0.75	1.94
$1\frac{1}{2}$	1.44	1.56	2.31	0.81	2.25
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	1.19	1.56	2.19	0.75	2.12
2	1.94	1.75	2.78	1.12	2.62

GENERAL NOTES:
(a) Dimensions are in inches.
(b) For dimensions of slip joint ends, see Table I-49.

Table I-21 Dimensions of DWV Double and Quadruple Branch Fittings

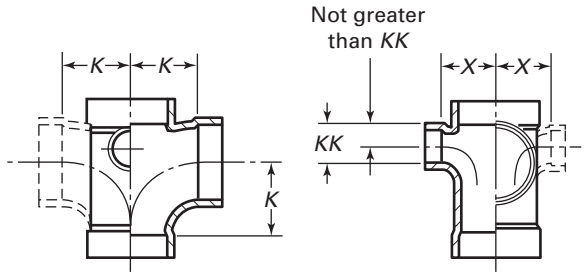


C × C × C × C
C × C × C × C × C × C
DWV Branch Fittings

Nominal Size	*A*	*B*	*C*
3 × 3 with $1\frac{1}{2}$-in. inlets	2.19	1.56	4.94
3 × 3 with $1\frac{1}{4}$-in. inlets	2.06	1.56	4.94
4 × 4 with $1\frac{1}{2}$-in. inlets	2.62	1.44	4.44
4 × 4 with $1\frac{1}{4}$-in. inlets	2.50	1.44	4.44

GENERAL NOTE: Dimensions are in inches.

Table I-22 Dimensions of Short Design DWV Tees With Side Inlet(s) (90 deg to Main Inlet), Single and Double

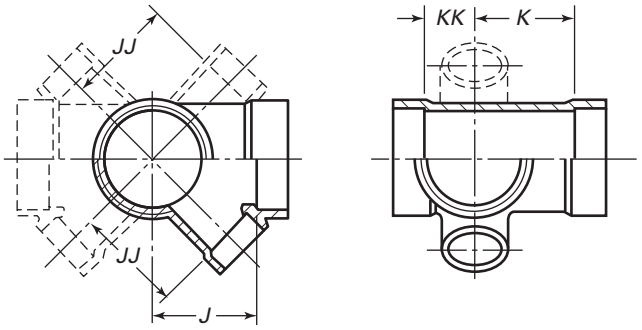


C × C × C With One or Two C Side Inlet(s)
C × C × C × C With One or Two C Side Inlet(s)
DWV Tees — Short Design

Nominal Sizes	*K*	*KK*	*X*
3 × 3 × 3 with 2-in. inlet(s)	2.94	1.50	2.25
3 × 3 × 3 with $1\frac{1}{2}$-in. inlet(s)	2.94	1.50	2.12

GENERAL NOTES:
(a) Dimensions are in inches.
(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing toward you. The side on which the other inlet appears determines its designation.

Table I-23 Dimensions of Short Design DWV Tees With Side Inlet(s) (45 deg to Main Inlet), Single and Double

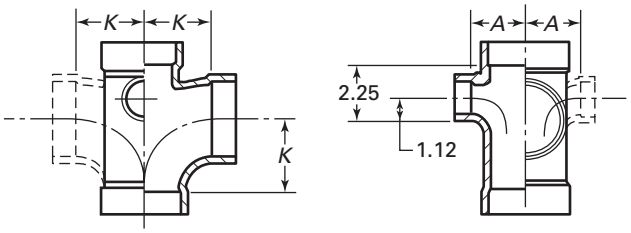


C × C × C With One or Two C Side Inlet(s)
DWV Tees — Short Design

Nominal Size	*K*	*KK*	*J*	*JJ*
3 × 3 × 3 with 2-in. inlet(s)	2.94	1.56	3.06	3.38
3 × 3 × 3 with 1½-in. inlet(s)	2.94	1.56	3.06	3.12

GENERAL NOTES:
(a) Dimensions are in inches.
(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing toward you. The side on which the other inlet appears determines its designation.

Table I-24 Dimensions of Long Design DWV Tees With Side Inlet(s) (90 deg to Main Inlet), Single and Double

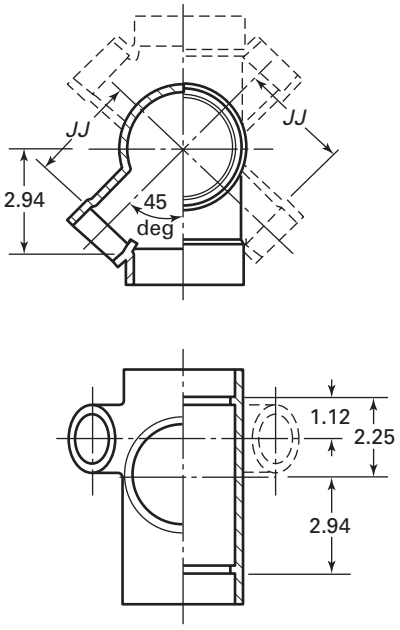


C × C × C With One or Two C Side Inlet(s)
C × C × C × C With One or Two C Side Inlet(s)
DWV Tees — Long Design

Nominal Size	*A*	*K*
3 × 3 × 3 with 2-in. inlet(s)	2.44	2.94
3 × 3 × 3 with 1½-in. inlet(s)	2.19	2.94
3 × 3 × 3 with 1¼-in. inlet(s)	2.06	2.94
4 × 4 × 4 with 2-in. inlet(s)	2.88	3.88
4 × 4 × 4 with 1½-in. inlet(s)	2.62	3.88

GENERAL NOTES:
(a) Dimensions are in inches.
(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing toward you. The side on which the other inlet appears determines its designation.

Table I-25 Dimensions of Long Design DWV Tees With Side Inlet(s) (45 deg to Main Inlet), Single and Double



C × C × C With One or Two C Side Inlet(s)
C × C × C × C With One or Two C Side Inlet(s)
DWV Tees — Long Design

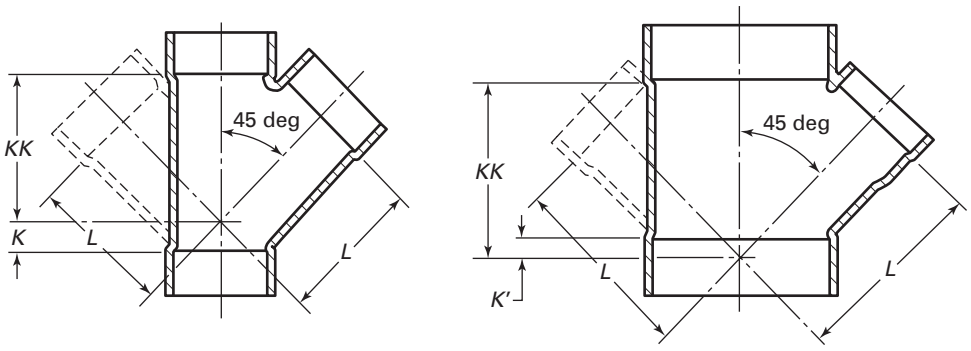
Nominal Sizes	*JJ*
3 × 3 × 3 with 2-in. inlet(s)	3.50
3 × 3 × 3 with $1\frac{1}{2}$-in. inlet(s)	3.19

GENERAL NOTES:

(a) Dimensions are in inches.

(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing toward you. The side on which the other inlet appears determines its designation.

Table I-26 Dimensions of Single and Double DWV 45-deg Ys

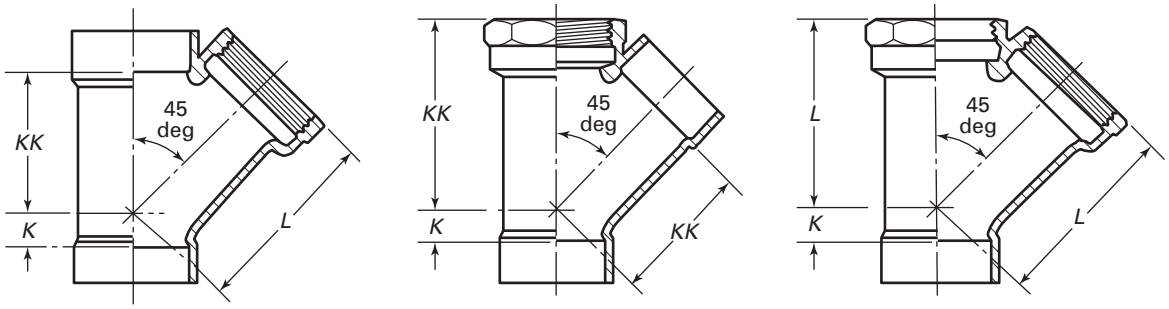


C × C × C
C × C × C × C
DWV 45-deg Ys

Nominal Size	*K*	*K′*	*KK*	*L*
1¼	0.31	. . .	1.88	1.88
1½	0.38	. . .	2.19	2.19
1½ × 1½ × 1¼	0.25	. . .	2.00	2.06
1½ × 1¼ × 1½	0.44	. . .	2.12	2.06
1½ × 1¼ × 1¼	0.25	. . .	1.94	1.94
2	0.36	. . .	2.75	2.75
2 × 2 × 1½	0.22	. . .	2.50	2.56
2 × 2 × 1¼	0.06	. . .	2.31	2.44
2 × 1½ × 2	0.53	. . .	2.62	2.53
2 × 1½ × 1½	0.28	. . .	2.19	2.19
2 × 1¼ × 1¼	0.06	. . .	2.34	2.56
3	0.81	. . .	4.12	4.12
3 × 3 × 2	0.12	. . .	3.38	3.50
3 × 3 × 1½	. . .	0.19	3.00	3.25
3 × 3 × 1¼	. . .	0.38	2.88	3.06
3 × 2 × 3	0.09	. . .	2.75	2.75
3 × 1½ × 3	. . .	0.38	2.44	2.55
3 × 1½ × 1½	. . .	0.34	2.19	2.19
4	1.06	. . .	5.38	5.38
4 × 4 × 3	0.34	. . .	4.62	4.75
4 × 4 × 2	. . .	0.34	3.88	4.19
4 × 4 × 1½	. . .	0.66	3.56	3.94
4 × 4 × 1¼	. . .	0.84	3.38	3.81
5	1.19	. . .	6.50	6.50
5 × 5 × 4	0.56	. . .	5.75	6.00
5 × 5 × 3	. . .	0.06	5.12	5.53
6	1.50	. . .	7.69	7.69
6 × 6 × 4	0.06	. . .	6.25	6.69
6 × 6 × 3	. . .	0.62	5.62	6.19
6 × 6 × 2	. . .	1.25	4.88	5.69
6 × 4 × 4	0.06	. . .	5.31	5.31
6 × 4 × 2	. . .	1.25	3.94	4.31
8	1.38	. . .	10.19	10.19
8 × 8 × 6	0.53	. . .	8.78	9.22
8 × 6 × 6	0.53	. . .	7.75	7.75

GENERAL NOTE: Dimensions are in inches.

Table I-27 Dimensions of DWV 45-deg Ys



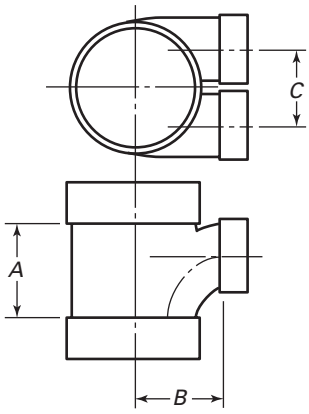
C × C × F C × F × C C × F × F

DWV 45-deg Ys

Nominal Size	*K*	*KK*	*L*
$1\frac{1}{4}$	0.31	1.88	2.75
$1\frac{1}{2}$	0.38	2.19	3.12
2	0.56	2.75	3.75
2 × $1\frac{1}{2}$ × 2	0.56	2.88	3.75
3	0.81	4.12	5.69
4	1.06	5.38	6.94

GENERAL NOTE: Dimensions are in inches.

Table I-28 Dimensions for DWV Horizontal Twin Branch Tees

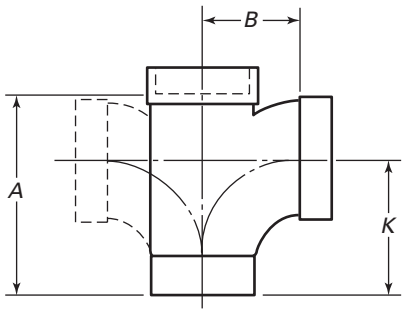


DWV Horizontal Twin Branch Tees
C × C × C × C

Nominal Size	*A*	*B*	Minimum, *C*
3 × 3 × $1\frac{1}{2}$ × $1\frac{1}{2}$	2.44	2.22	1.88
3 × 3 × $1\frac{1}{4}$ × $1\frac{1}{4}$	2.19	2.19	1.83

GENERAL NOTE: Dimensions are in inches.

Table I-29 Dimensions for DWV Fitting Tees, Single and Double

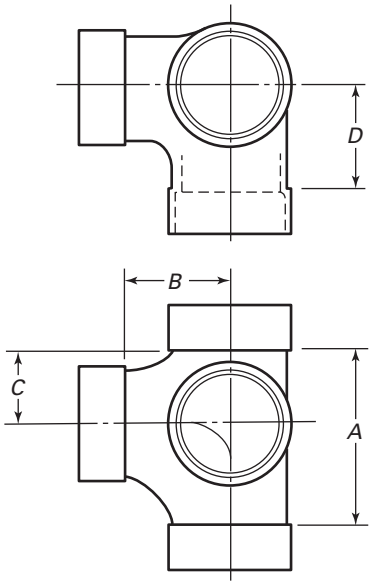


DWV Fitting Tees — Single and Double
FTG × C × C
FTG × C × C × C

Nominal Size	*A*	*B*	*K*
$1\frac{1}{2}$	2.78	1.41	1.97
2	3.45	1.88	2.50
3 × 3 × 2	3.75	2.38	2.62
3 × 3 × $1\frac{1}{2}$	3.19	2.16	2.22
3 × 3 × $1\frac{1}{4}$	2.72	2.00	1.87
3	5.25	2.88	3.62
3 × 2 × 3	4.94	2.88	3.62

GENERAL NOTE: Dimensions are in inches.

Table I-30 Dimensions for DWV Utility Tees

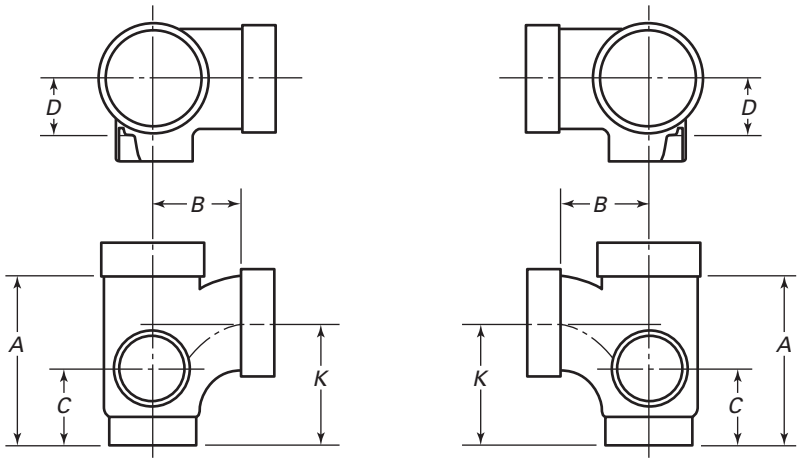


DWV Utility Tees
C × C × C × C

Nominal Size	*A*	*B*	*C*	*D*
$1\frac{1}{2}$	2.25	1.44	0.81	1.44
2	3.19	1.94	1.25	1.94
$2 \times 2 \times 1\frac{1}{2} \times 1\frac{1}{2}$	2.31	1.66	0.88	1.66

GENERAL NOTE: Dimensions are in inches.

Table I-31 Dimensions for DWV Fitting Tees With Side Inlet Maximum Below Centerline



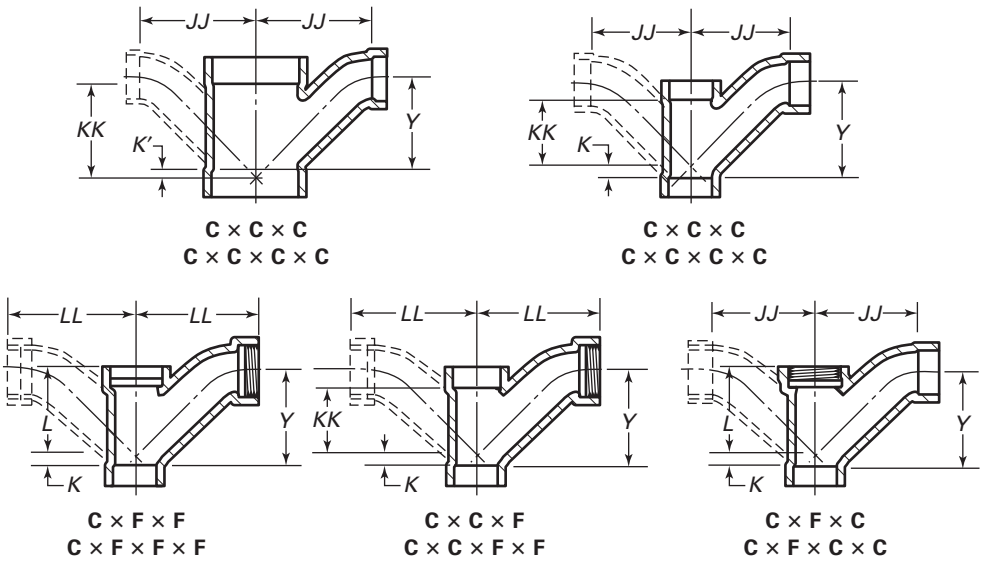
(a) Left Side Inlet
FTG × C × C × C

(b) Right Side Inlet
FTG × C × C × C

Nominal Size	*A*	*B*	*C*	*D*	*K*
3 × 3 × 3 × $1\frac{1}{2}$	5.25	2.94	2.16	1.75	3.75
3 × 3 × 3 × 2	5.25	2.94	2.41	1.75	3.75

GENERAL NOTE: Dimensions are in inches.

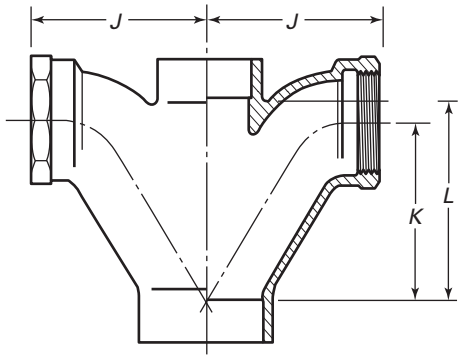
Table I-32 Dimensions of DWV Long Turn T–Ys, Single and Double



Nominal Size	*JJ*	*K*	*K′*	*KK*	*L*	*LL*	*Y*
$1\frac{1}{4}$	2.50	0.31	...	1.75	2.62	3.94	2.50
$1\frac{1}{2}$	3.00	0.38	...	2.12	3.12	3.81	3.00
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	2.81	0.19	...	1.94	3.00	3.81	2.62
2	4.00	0.56	...	2.62	3.62	4.81	4.00
$2 \times 2 \times 1\frac{1}{2}$	3.44	0.25	...	2.38	3.38	4.44	3.19
$2 \times 2 \times 1\frac{1}{4}$	3.00	0.06	...	2.12	...	...	2.69
$2 \times 1\frac{1}{2} \times 2$	4.00	0.56	...	2.81	...	...	4.00
$2 \times 1\frac{1}{4} \times 2$	4.00	0.50	...	2.44	...	...	4.00
3	5.88	0.81	...	3.88	5.44	9.00	5.88
3 × 3 × 2	4.69	0.09	...	3.25	...	...	4.12
$3 \times 3 \times 1\frac{1}{2}$	3.94	...	0.22	2.88	...	...	3.25
$3 \times 3 \times 1\frac{1}{4}$	3.75	...	0.41	2.78	...	...	2.81
3 × 2 × 3	5.88	0.81	...	3.44	...	...	5.88
3 × 2 × 2	4.50	0.06	...	2.75	...	...	4.00
4	7.75	1.06	...	5.00	6.69	9.00	7.75
4 × 4 × 3	5.62	0.44	...	4.50	...	...	5.12
4 × 4 × 2	5.12	...	0.25	3.88	...	...	4.25
$4 \times 4 \times 1\frac{1}{2}$	4.88	...	0.62	3.47	...	...	3.62
5	9.94	1.25	...	6.50	...	...	9.78
5 × 5 × 4	8.62	0.59	...	5.84	...	...	7.97
5 × 5 × 3	7.25	...	0.06	5.19	...	...	6.16
6	11.81	1.53	...	7.78	...	...	11.62
6 × 6 × 5	10.44	0.88	...	7.09	...	...	9.78
6 × 6 × 4	9.09	0.19	...	6.34	...	...	7.91
6 × 6 × 3	7.69	...	0.50	5.69	...	...	6.12

GENERAL NOTE: Dimensions are in inches.

Table I-33 Dimensions of DWV Double Short T–Y (C × C × F × F)

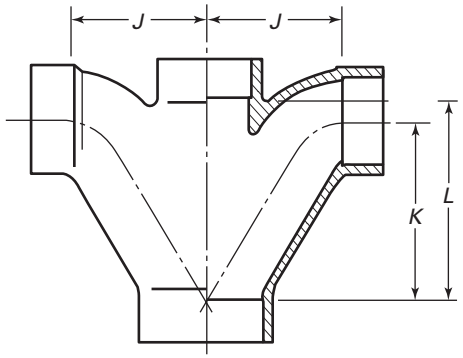


C × C × F × F
DWV Double Short T–Y

Nominal Size	J	K	L
2 × 1½ × 1½ × 1½	3.06	3.19	3.25
2 × 2 × 1½ × 1½	3.44	3.62	3.66
2 × 1½ × 2 × 2	3.75	4.19	4.19
2 × 1½ × 1¼ × 1¼	3.06	3.19	3.56

GENERAL NOTE: Dimensions are in inches.

Table I-34 Dimensions of DWV Double Short T–Y (C × C × C × C)

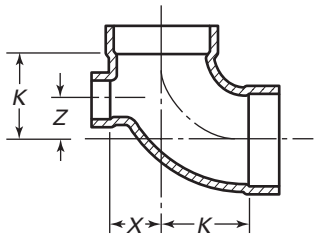


C × C × C × C
DWV Double Short T–Y

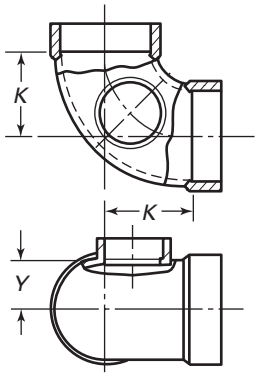
Nominal Size	J	K	L
1½	2.51	3.26	3.29
2	3.38	4.09	4.00
2 × 2 × 1½ × 1½	2.78	3.62	3.68
2 × 1½ × 2 × 2	3.00	4.19	4.19
2 × 1½ × 1½ × 1½	2.38	3.19	3.25
3	4.44	5.66	5.75

GENERAL NOTE: Dimensions are in inches.

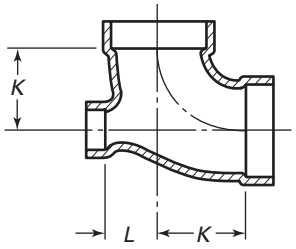
Table I-35 Dimensions of DWV Elbow With Inlets



DWV 90-deg Elbow With High Heel Inlet
C × C × C



DWV 90-deg Elbow With Side Inlet
C × C × C

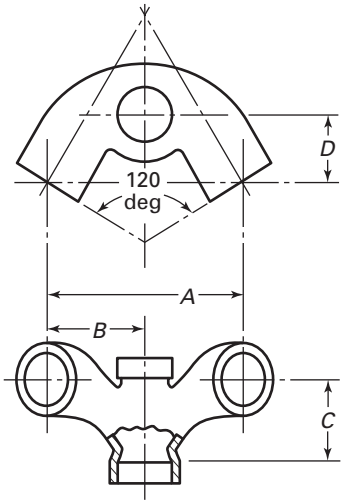


DWV 90-deg Elbow With Low Heel Inlet
C × C × C

Nominal Size	K	X	Y	Z	L
3 × 3 × 2	2.94	1.69	1.69	1.50	1.28
3 × 3 × 1½	2.94	1.69	1.69	1.50	1.19
3 × 3 × 1¼	2.94	1.69	1.69	1.50	1.12
4 × 4 × 2	3.88	2.12	2.25	2.00	1.88
4 × 4 × 1½	3.88	2.06	2.25	2.00	1.28

GENERAL NOTE: Dimensions are in inches.

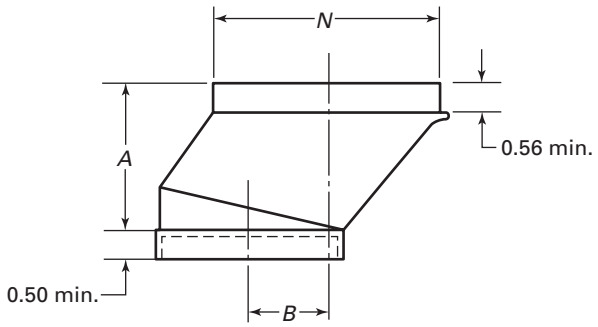
Table I-36 Dimensions of DWV Double Branch Sink Fittings



Type	Nominal Size	*A*	*B*	*C*	*D*
C × C × F × F	2 × 1½ × 1½ × 1½	6.25	3.12	2.25	1.88
C × C × C × C	2 × 1½ × 1½ × 1½	6.25	3.12	2.25	1.88

GENERAL NOTE: Dimensions are in inches.

Table I-37 Dimensions of DWV Closet Offset Fittings

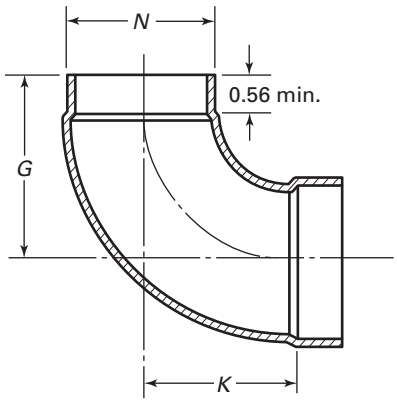


FTG × C

			N	
Nominal Size	*A*	*B*	Min.	Max.
4	2.50	1.94	4.1215	4.1270
4 × 3	2.50	1.44	4.1215	4.1270

GENERAL NOTE: Dimensions are in inches.

Table I-38 Dimensions of DWV 90-deg Closet Elbow

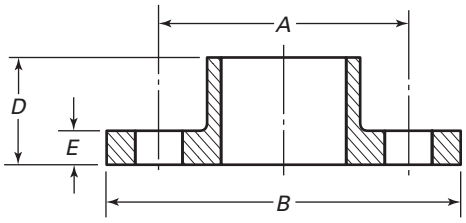


DWV 90-deg Closet Elbow
FTG × C

Nominal Size	*K*	*N*		*G*
		Min.	Max.	
4	3.88	4.1215	4.1270	4.44
3	2.94	3.1215	3.1270	3.50
4 × 3	2.88	4.1215	4.1270	3.72

GENERAL NOTE: Dimensions are in inches.

Table I-39 Dimensions of Floor Flange Vent Support



Floor Flange Vent Support
[Note (1)]

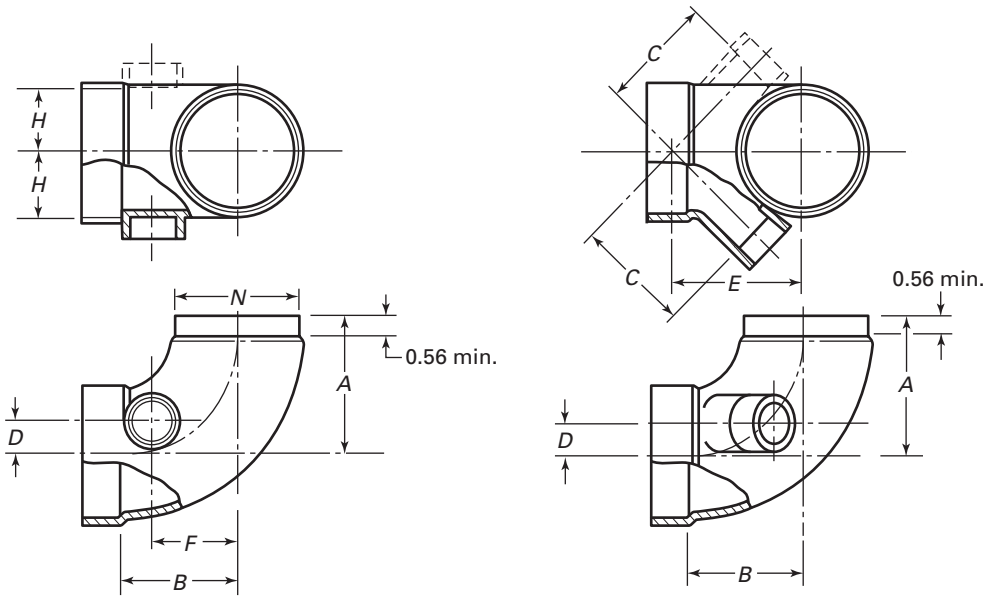
Nominal Size	*A*	*B*	*D*	Minimum, *E*	Bolt Hole Size	Number of Holes
$1\frac{1}{4}$	2.62	3.06	0.62	0.19	0.22	2
$1\frac{1}{2}$	2.62	3.05	0.69	0.19	0.22	2
2	3.38	3.94	0.75	0.19	0.22	2
3	4.50	5.12	0.94	0.19	0.25	2
4	5.50	6.12	1.19	0.19	0.25	2
5	6.94	8.00	1.44	0.38	0.44	4
6	7.88	9.00	1.69	0.50	0.56	4
8	10.00	11.00	2.12	0.62	0.56	4

GENERAL NOTE: Dimensions are in inches.

NOTE:

(1) May be round or oval design.

Table I-40 Dimensions of DWV Closet Ells With Side Inlet(s) (90 deg and 45 deg) to Main Inlet(s)

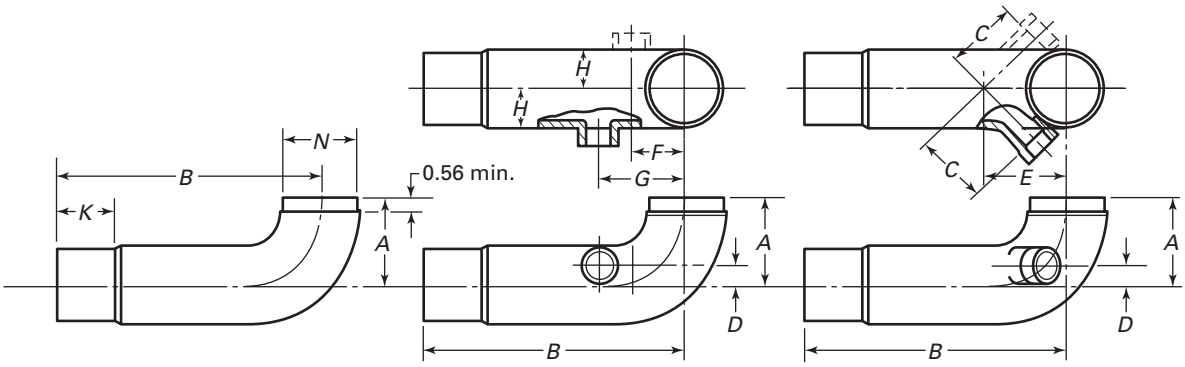


FTG × C With One or Two C Side Inlet(s)
DWV — 90-deg Closet Elbows

Nominal Size	*A*	*B*	*C*	*D*	*E*	*F*	*H*	*N* Min.	*N* Max.
4 × 3 with $1\frac{1}{2}$-in. inlet(s)	4.44	3.88	3.62	0.56	4.03	2.81	1.72	4.123	4.127
4 × 4 with $1\frac{1}{2}$-in. inlet(s)	4.44	3.88	3.81	1.00	4.22	2.81	2.09	4.123	4.127

GENERAL NOTES:
(a) Dimensions are in inches.
(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing up and toward you. The side on which the other inlet appears determines its designation.

Table I-41 Dimensions of DWV Closet Ells With or Without Side Inlet(s) (90 deg and 45 deg) to Main Inlet(s)



FTG × FTG

FTG × C With One or Two C Side Inlet(s)

DWV — 90-deg Closet Elbows

Nominal Size	Minimum, A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*K*	*N* Min.	*N* Max.
4 × 3	4.44	14.00	. . .	. . .	. . .	. . .	. . .	. . .	3.18	4.123	. . .
4 × 3 with 1½-in. inlet(s)	4.44	14.00	3.62	0.56	4.03	2.94	4.69	1.72	3.18	. . .	4.127
4 × 4	4.44	14.00	. . .	. . .	. . .	. . .	. . .	. . .	3.18	4.123	. . .
4 × 4 with 1½-in. inlet(s)	4.44	14.00	3.81	1.00	4.22	2.81	4.56	2.09	3.18	. . .	4.127

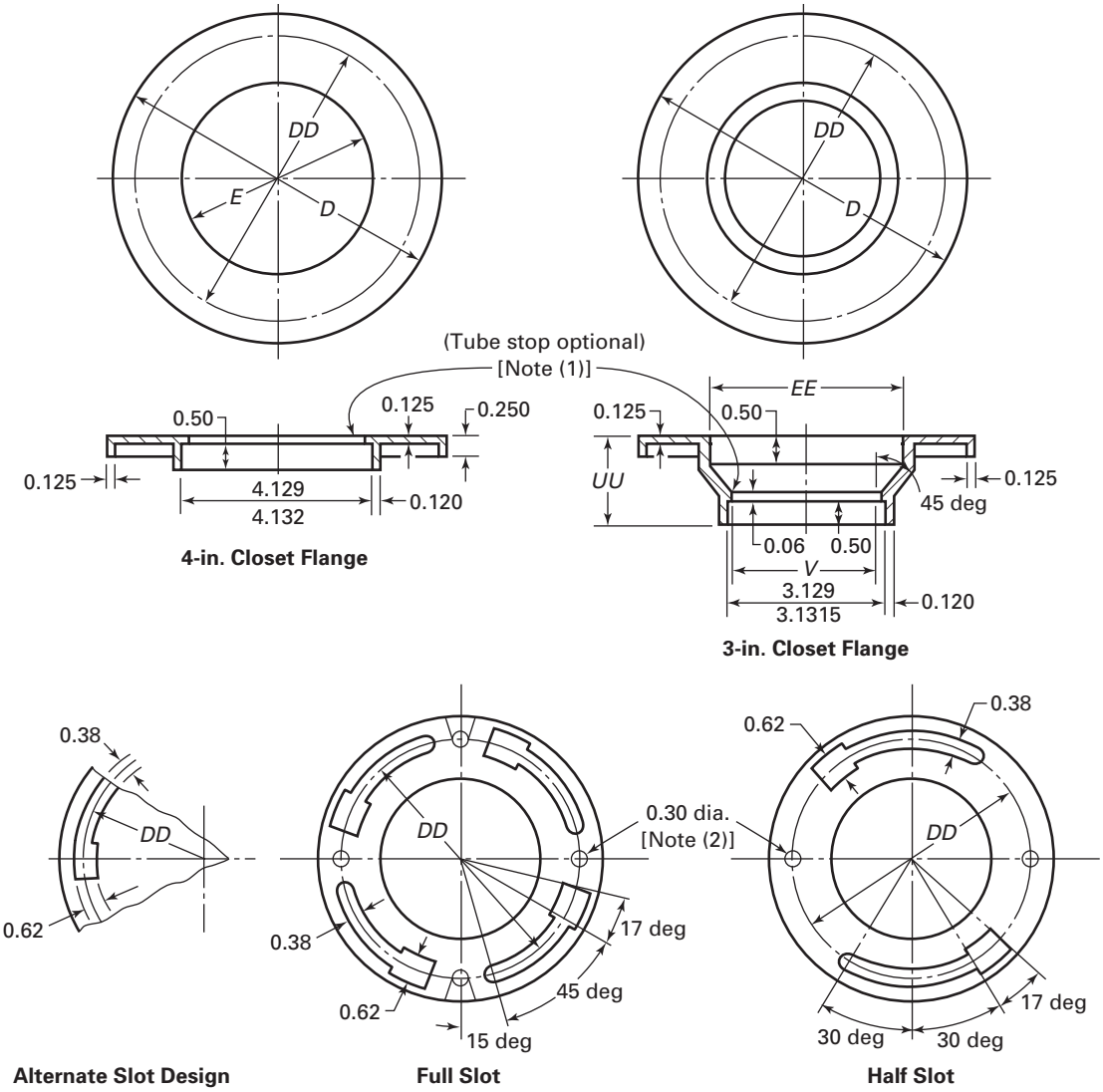
GENERAL NOTES:

(a) Dimensions are in inches.

(b) To determine whether inlets are right-hand or left-hand, place the fitting with large side inlet facing up and toward you. The side on which the other inlet appears determines its designation.

(c) Closet flange attaches to 4-in. end.

Table I-42 Dimensions of DWV Closet Flanges



Suggested Slot Arrangements

D	Outside diameter of flange, max.	7.00
DD	Diameter of centerline of slots	6.00
E	Inside diameter of 4-in. flange (if tube stop is used)	3.94
EE	Inside diameter of 3-in. flange	4.12
UU	Length of 3-in. flange	1.69
V	Bore of tube stop in 3-in. flange	2.94

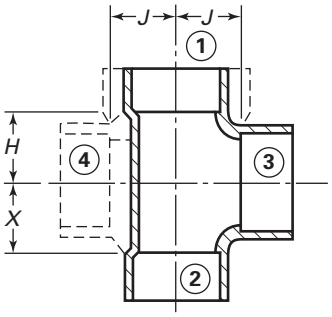
GENERAL NOTE: Dimensions are in inches.

NOTES:

(1) 45-deg angle may be extended to face of flange.

(2) Optional:
(a) the addition of 0.30-in.-diameter holes with or without countersink on bolt circle *DD* and/or
(b) two 0.38-in.-wide notches on centerline extending from the outer edge of flange

Table I-43 Dimensions of Vent Tees and Vent Double Tees



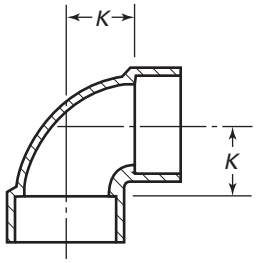
Vent Tees and Vent Double Tees
Vent Increasers With Side Inlets

C × C × C and C × C × C × C
① ② ③ ① ② ③ ④

Nominal Size	*H*	*J*	*X*
$1\frac{1}{4}$	0.87	0.87	0.87
$1\frac{1}{2}$	1.00	1.00	1.00
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	0.87	1.00	0.87
2	1.25	1.25	1.25
$2 \times 2 \times 1\frac{1}{2}$	1.00	1.25	1.00
$2 \times 2 \times 1\frac{1}{4}$	0.87	1.25	0.87
3	1.75	1.75	1.75
$3 \times 3 \times 2$	1.25	1.75	1.25
$3 \times 3 \times 1\frac{1}{2}$	1.00	1.75	1.00
$3 \times 3 \times 1\frac{1}{4}$	0.87	1.75	0.87
$3 \times 4 \times 2$	1.19	2.19	1.19
$3 \times 4 \times 1\frac{1}{2}$	1.06	2.12	1.00

GENERAL NOTES:
(a) Dimensions are in inches.
(b) Vent fittings are designed for dry vents only. They are not specified for waste lines. Vent fittings must be marked as follows: VENT ONLY.

Table I-44 Dimensions of Vent Elbows

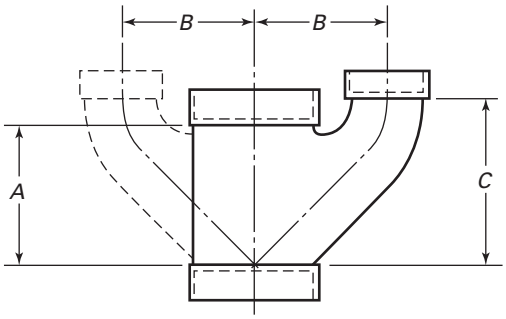


Vent Elbows
C × C

Nominal Size	*K*
$1\frac{1}{4}$	0.87
$1\frac{1}{2}$	1.00
2	1.25
3	1.75

GENERAL NOTES:
(a) Dimensions are in inches.
(b) Vent fittings are designed for dry vents only. They are not specified for waste lines. Vent fittings must be marked as follows: VENT ONLY.

Table I-45 Dimensions of DWV Stack Upturns, Single and Double

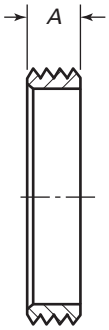


DWV Stack Upturns,
Single and Double
C × C × C and C × C × C × C

Nominal Size	*A*	*B*	*C*
2	3.25	3.50	4.72
$2 \times 2 \times 1\frac{1}{2}$	2.56	3.12	3.84
$2 \times 1\frac{1}{2} \times 1\frac{1}{2}$	2.38	2.75	3.47
3	5.09	3.75	5.69
$3 \times 3 \times 2$	3.44	3.41	4.19
$3 \times 3 \times 1\frac{1}{2}$	2.69	3.16	3.44
$4 \times 4 \times 3$	5.03	4.25	5.66

GENERAL NOTE: Dimensions are in inches.

Table I-46 Dimensions of Slip Joint Pieces



DWV Slip Joint Thread Pieces
C × SJ
[Note (1)]

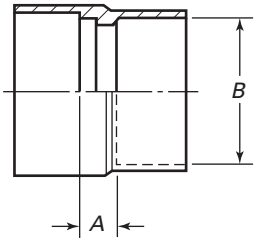
Nominal Size	*A*
$1\frac{1}{4}$	0.38
$1\frac{1}{2}$	0.38
$1\frac{1}{4} \times 1\frac{1}{2}$	0.38
2	0.38

GENERAL NOTE: Dimensions are in inches.

NOTE:

(1) For slip joint threads, see Table I-49.

Table I-47 Dimensions of Trap Coupling

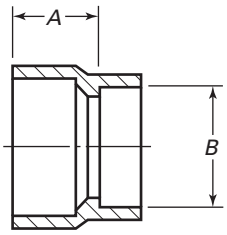


DWV Trap Coupling
C × O.D. Tube

Nominal Size	*A*	*B*
$1\frac{1}{4} \times 1\frac{1}{4}$ O.D.	0.13	1.25
$1\frac{1}{2} \times 1\frac{1}{2}$ O.D.	0.22	1.50
$1\frac{1}{2} \times 1\frac{1}{4}$ O.D.	0.25	1.25
$2 \times 1\frac{1}{2}$ O.D.	0.41	1.50

GENERAL NOTE: Dimensions are in inches.

Table I-48 Dimensions of Trap Extended Bushings

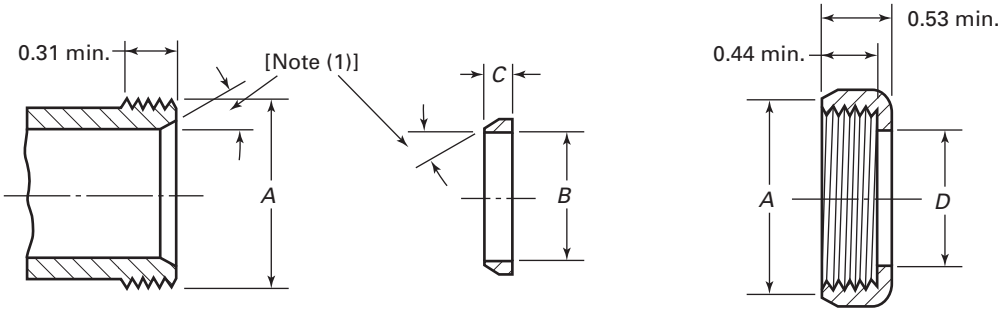


DWV Trap Extended Bushing
FTG × Outside Diameter of Tube (FTG × O.D. Tube)

Nominal Size	*A*	*B*
$1\frac{1}{2} \times 1\frac{1}{4}$ O.D.	0.75	1.25
$1\frac{1}{2} \times 1\frac{1}{2}$ O.D.	0.75	1.50

GENERAL NOTE: Dimensions are in inches.

Table I-49 Dimensions of Slip Joint Ends



Fitting SJ | **Gasket [Note (2)]** | **Nut [Note (3)]**

DWV Slip Joint Ends

O.D. Size	*A*	*B*	Minimum, *C*	*D*
$1\frac{1}{4}$	$1\frac{1}{4}$ NPSM	1.260	0.16	1.28
$1\frac{1}{2}$	$1\frac{1}{2}$ NPSM	1.510	0.19	1.53
2	2 NPSM	2.010	0.19	2.03

GENERAL NOTE: Dimensions are in inches.

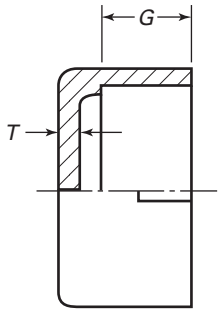
NOTES:

(1) Angles must be equal.

(2) Gasket to be pliable material not subject to aging or drying out.

(3) Nut may be any material specified in section 8, or any other suitable nonferrous alloy.

Table I-50 Dimensions of DWV Cap

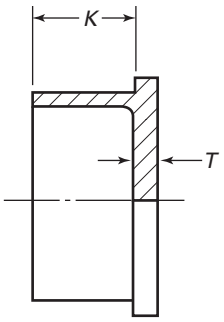


DWV Cap C

Nominal Size	*G*	*T*
$1\frac{1}{4}$	0.50	0.100
$1\frac{1}{2}$	0.56	0.100
2	0.62	0.100
3	0.75	0.120
4	1.00	0.120

GENERAL NOTE: Dimensions are in inches.

Table I-51 Dimensions of DWV Plugs

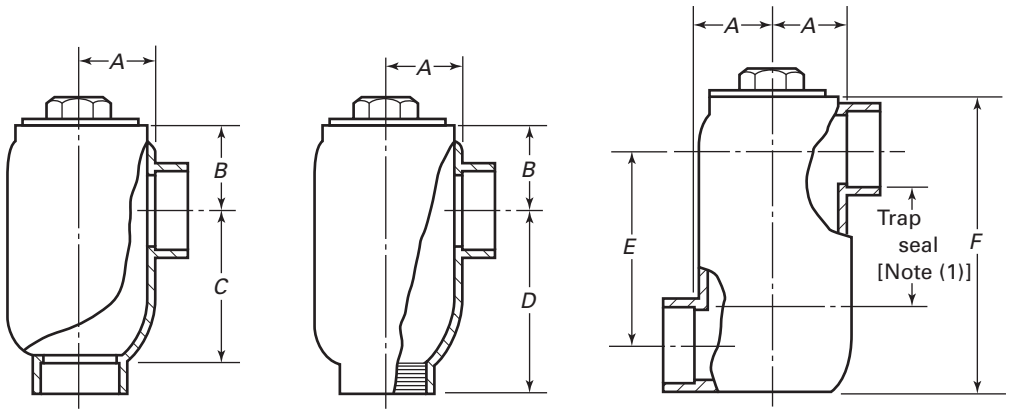


DWV Fitting Plug FTG

Nominal Size	*K*	*T*
$1\frac{1}{4}$	0.56	0.100
$1\frac{1}{2}$	0.62	0.100
2	0.69	0.100
3	0.81	0.120

GENERAL NOTE: Dimensions are in inches.

Table I-52 Dimensions of DWV Drum Traps



C × C C × F C × C

DWV One-Piece Drum Traps

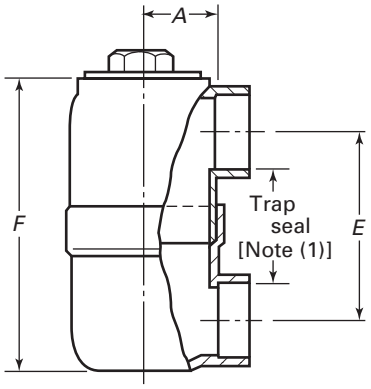
Type	Drum Size	Pipe and Tubing Size	Plug Size	*A*	*B*	*C*	*D*	*E*	Maximum, *F*
C × C	3 × 5	1½	2	1.50	1.72	2.97	...	...	...
C × F	3 × 5	1½	2	1.50	1.72	...	3.22	...	...
C × C	3 × 6	1½	2	1.50	...	...	...	3.88	6.75
C × F	4 × 5	1½	3	2.00	1.22	...	3.25	...	...
C × C	4 × 5	1½	3	2.00	1.22	...	...	...	...
C × C	4 × 8	1½	3	2.00	...	...	...	4.72	8.00
C × F	4 × 5	1¼	3	2.00	1.22	...	3.25	...	...
C × C	4 × 5	1¼	3	2.00	1.22	...	...	...	...

GENERAL NOTE: Dimensions are in inches.

NOTE:

(1) Trap seal is 2 in. min.

Table I-53 Dimensions of DWV Swivel Drum Traps



C × C
DWV Swivel Drum Traps

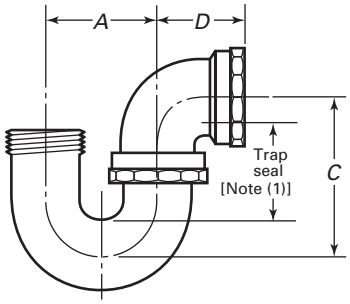
Type	Drum Size	Tube Size	Plug Size	*A*	*E*	Maximum, *F*
C × C	3 × 6	$1\frac{1}{2}$	2	1.50	3.88	6.75
C × C	4 × 8	$1\frac{1}{2}$	3	2.00	4.72	8.00
C × C	3 × 6	2	2	1.50	3.66	6.66
C × C	4 × 8	2	3	2.00	4.34	7.78

GENERAL NOTE: Dimensions are in inches.

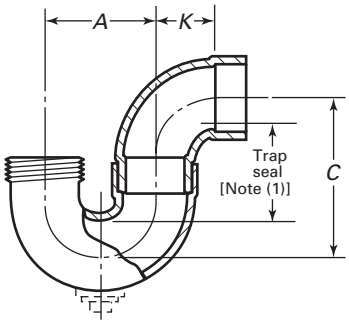
NOTE:

(1) Trap seal is 2 in. min.

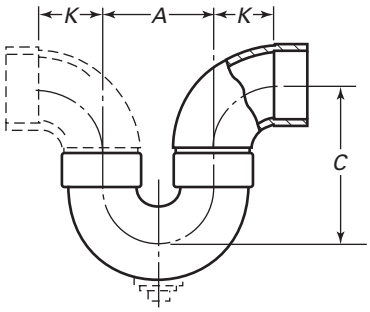
Table I-54 Dimensions of DWV Traps



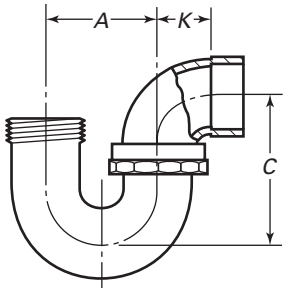
DWV P-Trap With Union Joint
SJ × F



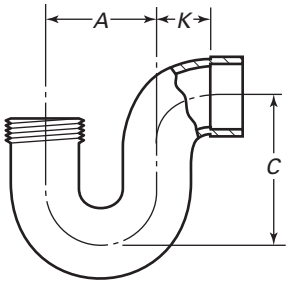
DWV P-Trap With or Without Cleanout
SJ × C



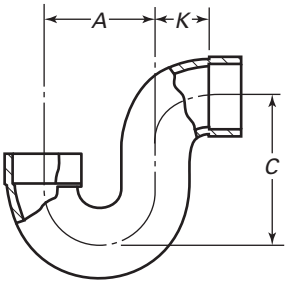
DWV P-Trap or Running Trap With or Without Cleanout
C × C



DWV P-Trap With Union Joint
SJ × C



DWV One-Piece P-Trap
SJ × C



DWV One-Piece Line P-Trap
C × C

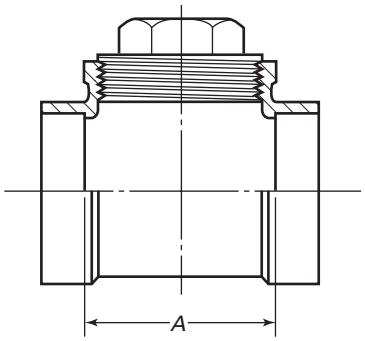
Description	Nominal Size	A	K	Minimum, C	D
P-trap SJ × C with or without cleanout	$1\frac{1}{4}$	2.19	1.19	3.28	. . .
P-trap C × C with or without cleanout	$1\frac{1}{2}$	2.44	1.44	3.53	. . .
Running P-trap C × C with or without cleanout	2	2.94	1.94	4.25	. . .
P-trap swivel SJ × C	$1\frac{1}{4}$	2.38	1.12	3.16	1.94
P-trap swivel SJ × F	$1\frac{1}{2}$	2.62	1.12	3.44	1.94
P-trap one-piece SC	2	3.12	1.47	3.91	2.81
P-trap one-piece CC	$1\frac{1}{2}$	2.44	1.44	3.53	. . .

GENERAL NOTE: Dimensions are in inches.

NOTE:

(1) Trap seal is 2 in. min. (all traps).

Table I-55 Dimensions of DWV Test Tees With Plug

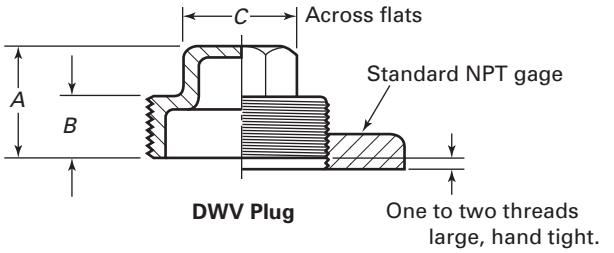


DWV Test Tees With Plug
C × C × F

Nominal Size	*A*
$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	2.00
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	2.25
2 × 2 × 2	2.75
3 × 3 × 3	3.88
4 × 4 × 4	5.50

GENERAL NOTE: Dimensions are in inches.

Table I-56 Dimensions of DWV Plugs



DWV Plug

Nominal Size	*A*	*B*	*C*
$1\frac{1}{4}$	0.88	0.44	0.88
$1\frac{1}{2}$	1.00	0.50	1.00
2	1.09	0.53	1.12
3	1.31	0.62	1.38
4	1.38	0.66	1.38
5	1.44	0.69	1.50
6	1.53	0.72	1.50
8	1.75	0.75	1.75

GENERAL NOTE: Dimensions are in inches.

(11)

MANDATORY APPENDIX II
REFERENCES

The following is a list of publications referenced in this Standard. Unless otherwise stated, the latest edition of ASME publications shall apply.

ANSI/ASME B1.20.1, Pipe Threads, General Purpose (Inch)

ASME B16.12, Iron Threaded Drainage Fittings

ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings

ASME B16.29, Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings — DWV

Publisher: The American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900 (www.asme.org)

ASTM A74-2009, Standard Specification for Cast Iron Soil Pipe and Fittings

ASTM B32-2008, Standard Specification for Solder Metal

ASTM B62-2009, Standard Specification for Composition Bronze or Ounce Metal Castings

ASTM B306-2009, Standard Specification for Copper Drainage Tube (DWV)

ASTM B584-2009a, Standard Specification for Copper Alloy Sand Castings for General Applications

ASTM E29-08, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

Publisher: ASTM International (ASTM), 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 (www.astm.org)

ISO 9000:2005, Quality management systems — Fundamentals and vocabulary[1]

ISO 9001:2008, Quality management systems — Requirements[1]

Publisher: International Organization for Standardization (ISO), Central Secretariat, 1, ch. de la Voie-Creuse, Case postale 56, CH-1211 Genève 20, Switzerland/Suisse (www.iso.org)

MSS SP-25-2008, Standard Marking System for Valves, Fittings, Flanges and Unions

Publisher: Manufacturers Standardization Society of the Valve and Fittings Industry (MSS), 127 Park Street, NE, Vienna, VA 22180 (www.mss-hq.org)

[1] May also be obtained from the American National Standards Institute (ANSI), 25 West 43rd Street, New York, NY 10036.

NONMANDATORY APPENDIX A
QUALITY SYSTEM PROGRAM

The products manufactured in accordance with this Standard shall be produced under a quality system program following the principles of 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. The detailed documentation demonstrating program compliance shall be available to the purchaser at the manufacturer's facility. A written summary description of the program utilized 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.

[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 the prefix "Q," replacing the prefix "ISO." Each standard of the series is listed under References in Mandatory Appendix II.

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B16 AMERICAN NATIONAL STANDARDS FOR PIPING, PIPE FLANGES, FITTINGS, AND VALVES

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ASME B16.23-2011

ISBN 978-0-7918-3389-6

J01411