



Designation: A 888 – 07

Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications¹

This standard is issued under the fixed designation A 888; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers hubless cast iron soil pipe and fittings for use in gravity flow applications. It establishes standards covering material, manufacture, mechanical and chemical properties, dimensions, coating, test methods, inspection, certification, and product marking for hubless cast iron soil pipe and fittings. These pipe and fittings are intended for non-pressure applications, as the selection of the proper size for sanitary drain, waste, vent, and storm drain systems allows free air space for gravity drainage.

1.2 The EDP/ASA numbers indicated in this section represent a Uniform Industry Code adopted by the American Supply Association (ASA). A group designation prefix, 022, is assigned to hubless products, followed by the four-digit identification assigned to individual items and a check digit. This system has been instituted to facilitate EDP control through distribution channels, and is to be used universally in ordering and specifying product items. Those items with no EDP numbers are either new, special, or transitory and will be assigned numbers on subsequent prints of this specification.

1.3 This specification covers pipe and fittings of the following patterns and applies to any other patterns that conform with the applicable requirements given in this specification.²

1.3.1 Lengths:

EDP/ASA Identification Numbers for Hubless Pipe
10 ft (3.0 m) in sizes and 5 ft. (1.5 m)
1½, 2, 3, 4, 5, 6, 8,
10, 12, and 15 in.
Method of Specifying Fittings

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Fig. 3

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Quarter Bend, Reducing
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¹ This specification is under the jurisdiction of ASTM Committee A04 on Iron Castings and is under the direct responsibility of Subcommittee A04.12 on Pipes and Tubes.

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1.4 The values stated in inch-pound units shall be regarded as the standard. The values given in parentheses shall be for information only. Metric conversions in Figs. 1 and 2 are to two decimal places; all other metric conversions are rounded to the nearest whole number.

1.5 The committee with jurisdiction over this standard is aware of another comparable standard published by the **Cast Iron Soil Pipe Institute, CISPI 301**.

NOTE 1—The text of this standard references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

2. Referenced Documents

2.1 ASTM Standards:³

- A 48/A 48M** Specification for Gray Iron Castings
- A 644** Terminology Relating to Iron Castings
- C 564** Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
- D 1248** Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
- E 8** Test Methods for Tension Testing of Metallic Materials

2.2 Federal Standard:⁴

- Fed. Std. No. 123** Marking for Shipment (Civil Agencies)

2.3 Military Standard:⁴

- MIL-STD-129** Marking for Shipment and Storage

2.4 ANS/ASME Standard:⁵

- B1.20** Pipe Threads

2.5 Other Documents:

- Uniform Freight Classification Rules**⁶
- National Motor Freight Classification Rules**⁷
- Cast Iron Soil Pipe Institute (CISPI) Specification 301**⁸

3. Terminology

3.1 Abbreviations:

- 3.2 AC—above center

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://www.dodssp.daps.mil>.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁶ Available from the Uniform Classification Commission, Room 1106, 222 S. Riverside Plaza, Chicago, IL 60606.

⁷ Available from National Motor Freight Traffic Association (NMFTA), 2200 Mill Rd., Alexandria, VA 22314, <http://www.nmfta.org>.

⁸ Available from Cast Iron Soil Pipe Institute, 5959 Shallowford Road, Suite 419, Chattanooga, TN 37421, <http://www.cispi.org>.

<i>ADAPTR</i> —adapter
&—and
ASA—American Supply Association
ASSY—assembly
BD—bend
CARL—Carlson
CF—Carlson fitting
CLO—closet
CO—cleanout
COMB—combination
CRS—cross
DB—double
DBL—double
EDP—electronic data processing
EXT—extended, extension
F—figure
FER—ferrule
FLNG—flange
FTG—fitting
HI—high
HOR—horizontal
INC—increaser, increasing
L—left hand
L/—less
LG—long
LH—left hand
LNG—long
/MAIN—on main
MN—on main
NO—New Orleans
R—right hand
RAD—radius
RED—reducer, reducing
REV—revent
RH—right hand
SAN—sanitary
SD—side
SL & NOTCH—slotted and notched
SO—side openings
ST—sanitary tap
T—tee
TAP—tap, tapped
TOT—tap on top
TP—tap, tapped
V—vent
VERT—vertical
W/—with
Y—wye

3.3 Definitions of Terms Specific to This Standard:

- 3.3.1 *manufacturer*—the entity that casts the pipe and fittings covered by this standard.

4. Materials and Manufacture

4.1 The pipe and fittings shall be iron castings suitable for installation and service for sanitary, storm drain, waste, and vent piping applications. The pipe and fittings shall meet all applicable requirements and tests given in this specification.

4.2 The castings shall be made of cast iron, produced by an established commercial method that provides control over

chemical and mechanical properties. Cast iron is a generic term for a series of alloys as defined in Terminology A 644 and includes gray iron as well as ductile iron. The castings shall be sound, true to pattern, and of compact close grain that permits drilling and cutting by ordinary methods. The interior surface shall be reasonably smooth and free from defects that would make the castings unfit for the use for which they are intended.

4.3 To minimize the possibility of introducing radioactive material to a melting operation, ferrous scrap, pig iron, and any recycled ferrous material shall be screened for radioactivity with suitable detection devices operated in accordance with the detection manufacturer’s instructions. Written operating and maintenance procedures for the detection equipment shall be provided to the purchaser for review when requested. Records shall be maintained by load of these tests for a period of seven years.

4.4 Material that is found contaminated with radioactivity shall not be used to produce products covered by this specification.

4.5 Analysis of castings after the time of production shall not be used to determine compliance to this specification.

5. Mechanical Properties

5.1 *Mechanical Tests for Gray Iron*—The manufacturer shall perform tests to determine mechanical properties of the gray iron used in the manufacture of gray iron soil pipe and fittings. Tension test specimens shall be employed. The manufacturer shall maintain a record of mechanical tests for a minimum of 7 years.

5.1.1 *Tensile Strength Test*—The tensile strength shall be not less than 21 000 psi (145 MPa).

5.1.2 Tension test reports shall include breaking load of test bars, machined diameter of test bar, and calculated tensile strength.

5.1.3 Analysis of castings or test bars after the time of production shall not be used as evidence of compliance to this specification.

6. Chemical Test for Gray Iron

6.1 The manufacturer shall perform tests to determine the significant chemical constituents of the gray iron used in the manufacture of gray iron soil pipe and fittings. Analysis shall be performed at the minimum of once per lot as defined in this specification. The manufacturer shall maintain a record of chemical tests performed for a minimum of seven years. The test results shall conform to the following requirements as to chemical composition:

Phosphorous (P)	0.38 % Maximum
Sulfur (S)	0.15 % Maximum
Chromium (Cr)	0.50 % Maximum
Titanium (Ti)	0.10 % Maximum
Aluminum (Al)	0.50 % Maximum
Lead (Pb)	0.015 % Maximum
Carbon Equivalent	4.10 % Minimum by mass
Note: Carbon equivalent for gray iron = %C+%Si/3+%P/3	

6.1.1 Chemical tests shall be performed at the time of production of the castings covered by this specification.

6.1.2 Analysis of castings after the time of production shall not be used as evidence of compliance to this specification.

7. Dimensions and Permissible Variations

7.1 *Pipe:*

7.1.1 *Ends of Pipe*—The end of pipe shall be cast with or without a spigot bead. The pipe shall be cast in one piece.

7.1.2 *Dimensions of Pipe*—Pipe shall be 10 ft (3 m) long or 5 ft (1.5 m) long with the dimensions and tolerances specified in Figs. 1 and 2. (The laying length of pipe is the same as actual length.)

7.1.3 *Straightness of Pipe*—Pipe shall be straight to the extent that for 10-ft (3-m) lengths, deflections in the barrel shall not exceed 5/8 in. (16 mm). For 5-ft (1.5-m) lengths, deflections in the barrel shall not exceed 5/16 in. (8 mm).

7.2 *Fittings:*

7.2.1 *Dimensions of Fittings*—All fittings shall conform to the dimensions and tolerances specified in Figs. 1 and 2 as applicable. Fittings of the patterns specified in this specification shall conform to the applicable dimensions in Figs. 6-72, inclusive. Fittings not listed shall conform to Fig. 1 for wall thickness and dimension R for the minimum radius of any drain inlets that any such fittings provide.

7.2.2 All Bends, Sanitary Tees, Stack fittings and special fittings that perform the function of a sanitary tee, designed for the conveyance of soil and/or waste affluent shall have a radius not less than the following:

Nominal Size of Run or Branch (in.)	Minimum Radius
1½ – 2	125 % of the smaller run or branch
3 – 4	100 % of the smaller run or branch
5 – 6	80 % of the smaller run or branch
8 – 10	70 % of the smaller run or branch
12 – 15	60 % of the smaller run or branch

7.2.3 *Ends of Fittings*—Ends shall have spigot beads as shown in Figs. 1 and 2. Positioning lugs shall be cast on fittings. Positioning lugs shall be as described in Fig. 2 or continuous around circumference of the fitting. Exception: where permitted in Figs. 3-72, spigot beads and gasket positioning lugs shall be optional depending on casting method used. It is permissible to increase the wall thickness on the inside surface of fitting ends. The increased thickness shall not reduce the minimum B dimension in Table 1 in excess of 0.06 in. and shall not extend more than 4¼ in. from the plain end. The increased thickness shall be tapered and shall offer no obstruction to flow.

TABLE 1 EDP Identification Numbers for Hubless Pipe

NOTE—When ordering by these EDP numbers, be sure to include the check (✓) digit following the item number (022 0126 7). This check digit is verification of the group and item number you select.

Manufacturer's Item	Code		Description ^A
	Group	Item No. ✓	
Hubless pipe (see Fig. 1.)	022	0156	10 ft (3 m) length 1½
		0158	2½
		0160	3
		0162	4
		0164	5
		0168	6
		0170	8
		0171	10
		0172	12
		0173	15

^A EDP numbers for fittings will appear in each of the respective tables.

7.2.4 *Pipe Threads*—Screw plugs and tapped openings in fittings shall have taper pipe threads in accordance with ANSI/ASME Standard **B1.20**.

7.2.5 Internal threads shall be chamfered at the entering end approximately to the major diameter of the thread, at an angle of approximately 45° with the axis of the thread for easy entrance in making a joint and for protection of the thread. The chamfer shall be concentric with the thread and shall be included in the measurement of the thread length.

8. Methods of Specifying Fittings

8.1 *Method of Specifying Sizes of Fittings of More than One Size*—The sizes shall be designated by the order of listing, as follows:

8.1.1 *Branch and Tapped Fittings*:

8.1.1.1 *Size of Run*—The run shall be that portion of the fitting that forms part of the main pipe line.

8.1.1.2 *Size of Branch*:

8.2 *Methods of Specifying Hand of Fittings with Side Inlets*—When placed in the position described below, if the side inlet appears on the right, it shall be a right-hand fitting; if on the left, it shall be a left-hand fitting.

8.2.1 *Branch Fittings*—The branch shall be placed toward the observer and the outlet end of the run lower than the branch.

8.3 The fitting illustrated in **Fig. 3** has a right-hand inlet. Left-hand fittings have these openings on the side opposite to that shown. Inlets on fittings shall be made with or without spigot bead and positioning lug.

9. Coating

9.1 The pipe and fittings shall be furnished coated. The pipe and fittings shall be uniformly coated with a material suitable for the purpose that is adherent, not brittle, and without a tendency to scale. The coating shall not contain asbestos above current MSDS reportable levels. Material safety data sheets shall be furnished by the coating manufacturer when requested. The coating shall be evenly and smoothly applied to all surfaces, except in threaded openings.

10. Sampling

10.1 Chemical and mechanical tests shall be made regularly and at sufficiently close intervals for adequate determinations of the significant chemical constituents and properties of the cast iron. Records of chemical analysis shall be maintained by the manufacturer. Copies of these analyses shall be furnished to the purchaser when requested.

10.2 A lot shall consist of one of the following:

10.2.1 All the metal poured from a single heating is a batch type furnace.

10.2.2 All the metal from two or more batch type melting furnaces poured into a single ladle or a single casting.

10.2.3 All the metal poured from a continuous melting furnace for a given period of time between changes in charge, processing conditions, or aim-for chemistry or 4 hours, whichever is the shorter period.

11. Test Methods

11.1 *Gray Iron*:

11.1.1 *Tensile Strength Test*—Test bars shall be cast in accordance with the requirements of Specification A 48. The machined test bar dimensions and drawing and dimensions of as cast test bars are found in **Fig. 4**. The tensile strength shall be determined in accordance with Test Methods **E 8**.

11.1.2 Tension test reports shall include breaking load of test bars, machined diameter of test bar, and calculated tensile strength.

12. Inspection

12.1 *Inspection and Test by the Manufacturer*—Pipe and fittings shall be inspected to verify compliance with this specification. The manufacturer shall maintain a record of all inspections.

12.2 *Pipe Inspection*—At regular intervals (not to exceed 12 h) during the course of production, sample pieces of each size of pipe or pipes being produced shall be selected randomly for inspection. Each pipe selected shall be measured by suitable gages and all dimensions detailed in **Fig. 1** of this specification verified to comply with the requirements of this specification. The inspection records shall be maintained by the manufacturer for a period of seven years.

12.3 *Fitting Inspection*—At regular intervals (not to exceed twelve hours) during the course of production, sample pieces of each size and configuration of fitting being produced shall be selected randomly for inspection. Each fitting selected shall be measured by suitable gages to verify that the laying length (as detailed in **Figs. 4-72**), and all applicable dimensions detailed in **Figs. 1 and 2** of this specification comply with the requirements of this specification. The inspection records shall be maintained by the manufacturer for a period of seven years.

12.4 *Marking Inspection*—Inspection shall include verification that the markings on pipe and fittings comply with Section **14** of this specification.

13. Certification

13.1 Upon request the purchaser shall be furnished certification, by the manufacturer, stating samples representing each lot have been tested and inspected as indicated in this specification and the requirements have been met. If required by the purchaser, certification shall be accompanied by test reports as prepared in accordance with Sections **11** and **12** of this specification. Tension test reports shall include breaking load machined diameters of test bars and calculated tensile strength. Certification shall include legal name and address of the manufacturer.

14. Product Marking

14.1 Each length of pipe and each fitting shall be plainly marked with the country of origin and the manufacturer's name or manufacturer's registered trademark by which the manufacturer can be readily identified after installation. The marking shall be adequate identification of the manufacturer of the pipe and fittings if it readily identifies the manufacturer to the end user of the product.

14.1.1 *Pipe Markings*—The pipe shall be marked continuously on the barrel with a minimum of 0.75-in. (19-mm) lettering starting within 3 in. of each end of the pipe. Each pipe

shall be marked with the date of manufacture. The marking shall be stenciled on the pipe or otherwise applied so as to be clear and legible.

14.1.2 On fittings, the marking shall be cast with raised letters that are not to be located within the “W” dimension, as shown in Fig. 2. Cast markings shall be raised from the wall of the fitting unless otherwise noted.

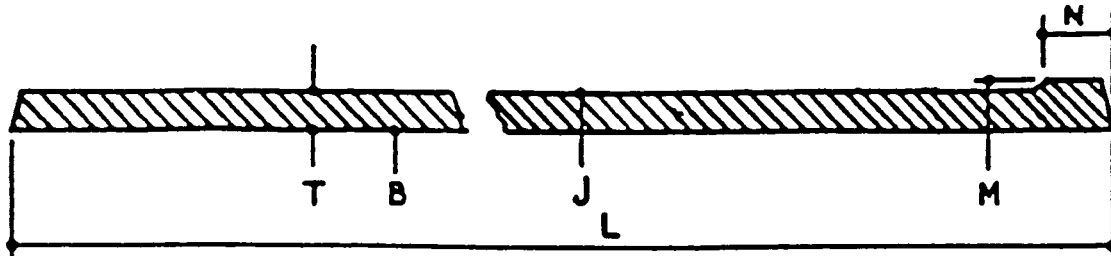
15. Packaging and Package Marking

15.1 Government Procurement—Unless otherwise specified in the contract, the material shall be packaged in accordance

with the supplier’s standard practice, which will be acceptable to the carrier at lowest rates. Containers and packing shall comply with Uniform Freight Classification Rules or National Motor Freight Classification Rules. Marking for shipment of such material shall be in accordance with Fed. Std. No. 123 for civil agencies and MIL-STD-129 for military agencies.

16. Keywords

16.1 cast iron; hubless pipe and fittings; no-hub pipe and fittings; soil pipe



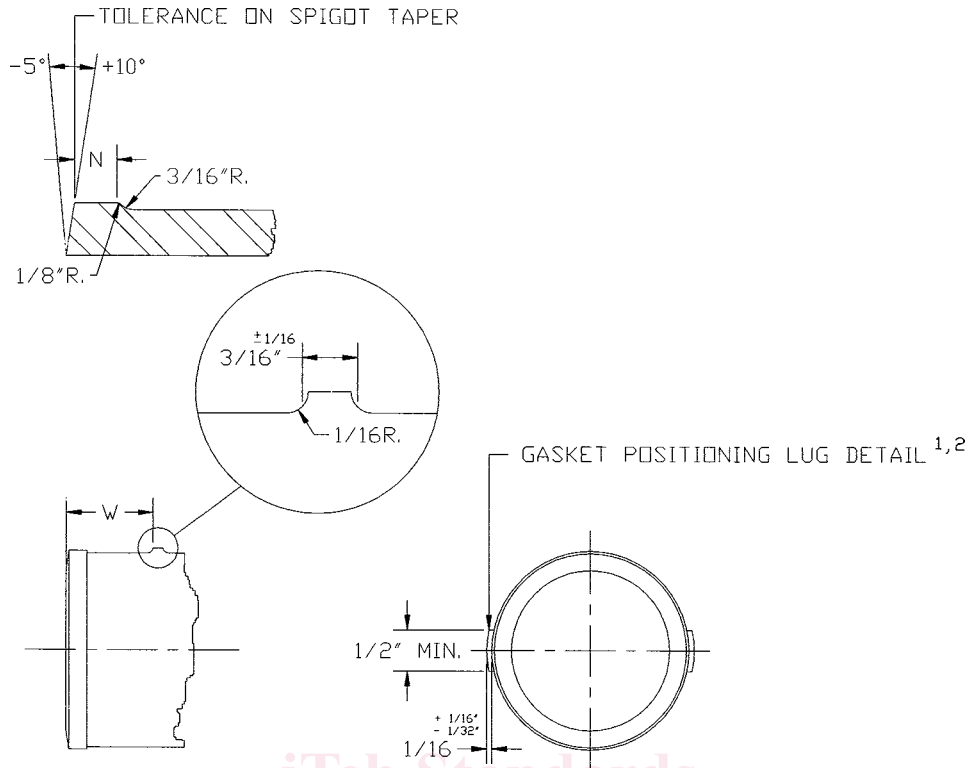
*Pipe shall be with or without a spigot bead.

Size	Barrel		Spigot		Barrel Thickness, T		Gasket Positioning Lug ^A	Laying Length, L ^B
	Inside Diameter	Outside Diameter	Outside Diameter	Bead Width ^A	Nominal	Minimum		
	B	J	M	N, ±0.13 (3.3)			W	10 ft ± 0.50 in. (3.0480 m ± 13 mm)
1½	1.50 ± 0.09 (38.1 ± 2.29)	1.90 ± 0.06 (48.26 ± 1.52)	1.96 ± 0.06 (49.78 ± 1.52)	0.25 (6.35)	0.16	0.13 (3.3)	1.13 (28.7)	120 (3048)
2	1.96 ± 0.09 (49.8 ± 2.29)	2.35 ± 0.09 (59.69 ± 2.29)	2.41 ± 0.09 (61.21 ± 2.29)	0.25 (6.35)	0.16	0.13 (3.3)	1.13 (28.7)	120 (3048)
3	2.96 ± 0.09 (75.2 ± 2.29)	3.35 ± 0.09 (85.09 ± 2.29)	3.41 ± 0.09 (86.61 ± 2.29)	0.25 (6.35)	0.16	0.13 (3.3)	1.13 (28.7)	120 (3048)
4	3.94 ± 0.09 (100.08 ± 2.29)	4.38 ± 0.09 (111.25 ± 2.29)	4.44 ± 0.09 (112.78 ± 2.29)	0.31 (7.87)	0.19	0.15 (3.81)	1.13 (28.7)	120 (3048)
5	4.94 ± 0.09 (125.48 ± 2.29)	5.30 ± 0.09 (134.62 ± 2.29)	5.36 ± 0.09 (136.14 ± 2.29)	0.31 (7.87)	0.19	0.15 (3.81)	1.50 (38.1)	120 (3048)
6	5.94 ± 0.09 (150.88 ± 2.29)	6.30 ± 0.09 (160.02 ± 2.29)	6.36 ± 0.09 (161.54 ± 2.29)	0.31 (7.87)	0.19	0.15 (3.81)	1.50 (38.1)	120 (3048)
8	7.94 ± 0.13 (201.68 ± 3.3)	8.38 ± 0.09 (212.85 ± 3.3)	8.44 ± 0.09 (214.38 ± 2.29)	0.31 (7.87)	0.23	0.17 (4.32)	2.00 (50.8)	120 (3048)
10	10.00 ± 0.13 (254 ± 3.3)	10.56 ± 0.09 (268.22 ± 2.29)	10.62 ± 0.09 (269.75 ± 2.29)	0.31 (7.87)	0.28	0.22 (5.59)	2.00 (50.8)	120 (3048)
12	11.94 ± 0.13 (303.28 ± 3.3)	12.50 ± 0.13 (317.5 ± 3.3)	12.62 ± 0.13 (320.55 ± 3.3)	0.31 (7.87)	0.28	.22 (5.59)	2.75 (69.85)	120 (3048)
15	15.11 ± 0.13 (383.79 ± 3.3)	15.83 ± 0.13 (402.08 ± 3.3)	16.12 ± 0.13 (409.45 ± 3.3)	0.31 (7.87)	0.36	.30 (7.62)	2.75 (69.85)	120 (3048)

^A See Fig. 2 for details of the spigot and gasket positioning lug.

^B Laying lengths as listed in Fig. 1 shall be for pipe only, and such pipe shall be 10 ft (3 m) long. Laying length for fittings are listed in the applicable tables.

FIG. 1 Dimensions and Tolerances in Inches (Millimetres) of Spigots and Barrels for Hubless Pipe and Fittings



NOTE 1—Pipe shall be cast with or without the gasket positioning lugs. These lugs, as illustrated above, shall be cast as illustrated or be continuous around the entire circumference.

NOTE 2—Gasket positioning lugs shall be cast on all fittings except as otherwise noted. These lugs, as illustrated above, shall be cast as illustrated or be continuous around the entire circumference.

Size, in.	Spigot Detail, N in. (mm) ±0.13 (3.3)	Gasket Lug Location, W in. (mm) ±0.13 (3.3)
1½	0.25 (6)	1.13 (29)
2	0.25 (6)	1.13 (29)
3	0.25 (6)	1.13 (29)
4	0.31 (8)	1.13 (29)
5	0.31 (8)	1.50 (38)
6	0.31 (8)	1.50 (38)
8	0.31 (8)	2.00 (51)
10	0.31 (8)	2.00 (51)
12	0.31 (8)	2.75 (70)
15	0.31 (8)	2.75 (70)

FIG. 2 Details of Spigot Bead and Gasket Positioning Lug

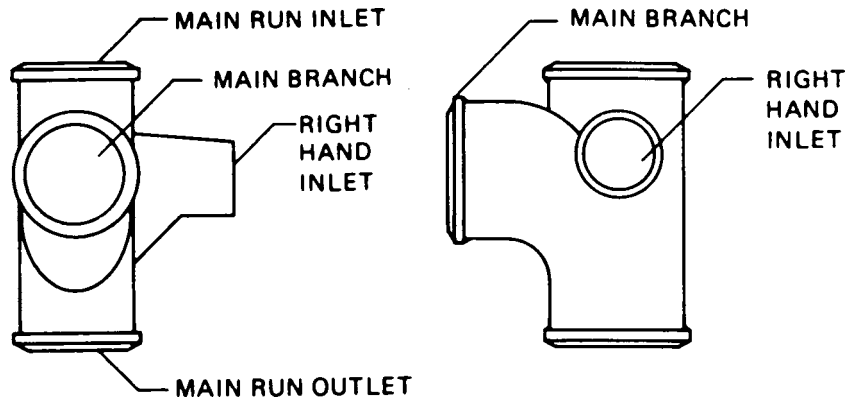
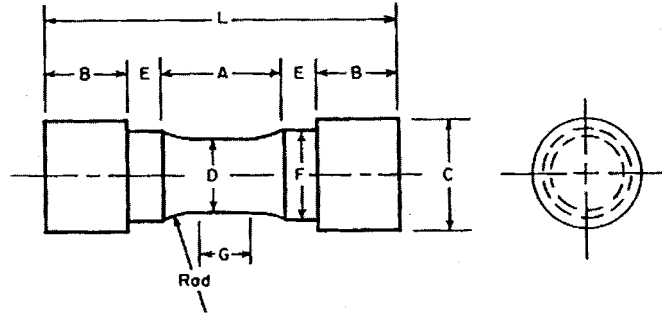


FIG. 3 Specifying Hand of Fittings with Side Inlets or Outlets



Dimensions, in (mm)
 G—Length of parallel, min
 D—Diameter
 R—Radius of fillet, min
 A—Length of reduced section, min
 L—Overall length, min
 C—Diameter of end section, approx
 E—Length of shoulder, min
 F—Diameter of shoulder
 B—Length of end section

Tension Test Specimen B
 0.75 (19)
 0.750 ± 0.015 (19.0 \pm 0.38)
 1 (25)
 $1\frac{1}{2}$ (38)
 4 (100)
 $1\frac{1}{4}$ (32)
 $\frac{1}{4}$ (6)
 $\frac{15}{16} \pm \frac{1}{64}$ (25 \pm 0.4)
 A

Test Bar	As-Cast Diameter, in. (mm)			Length, in. (mm)	
	Nominal (Mid-Length)	Minimum (Bottom)	Maximum (Top)	Minimum (Specified)	Maximum (Recommended)
B	1.20 (30.5)	1.14 (29.0)	1.32 (33.5)	6.0 (150)	9.0 (230)

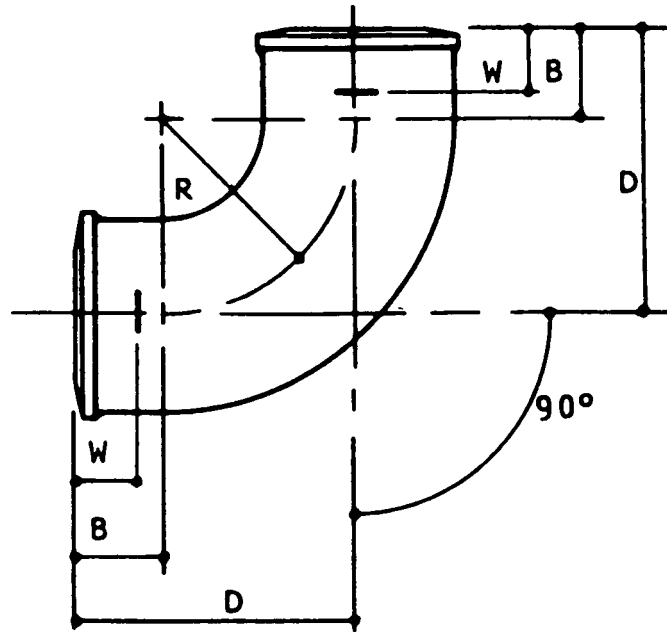
^A Optional to fit holders on testing machine. If threaded, root diameter shall not be less than dimension F.

FIG. 4 Sample Test Bar

iTeh Standards
 (https://standards.iteh.ai)
 Document Preview

ASTMA888-07

https://standards.iteh.ai/catalog/standards/sist/31f601ad-1ad4-49a6-8233-a6f01ed33dc6/astm-a888-07



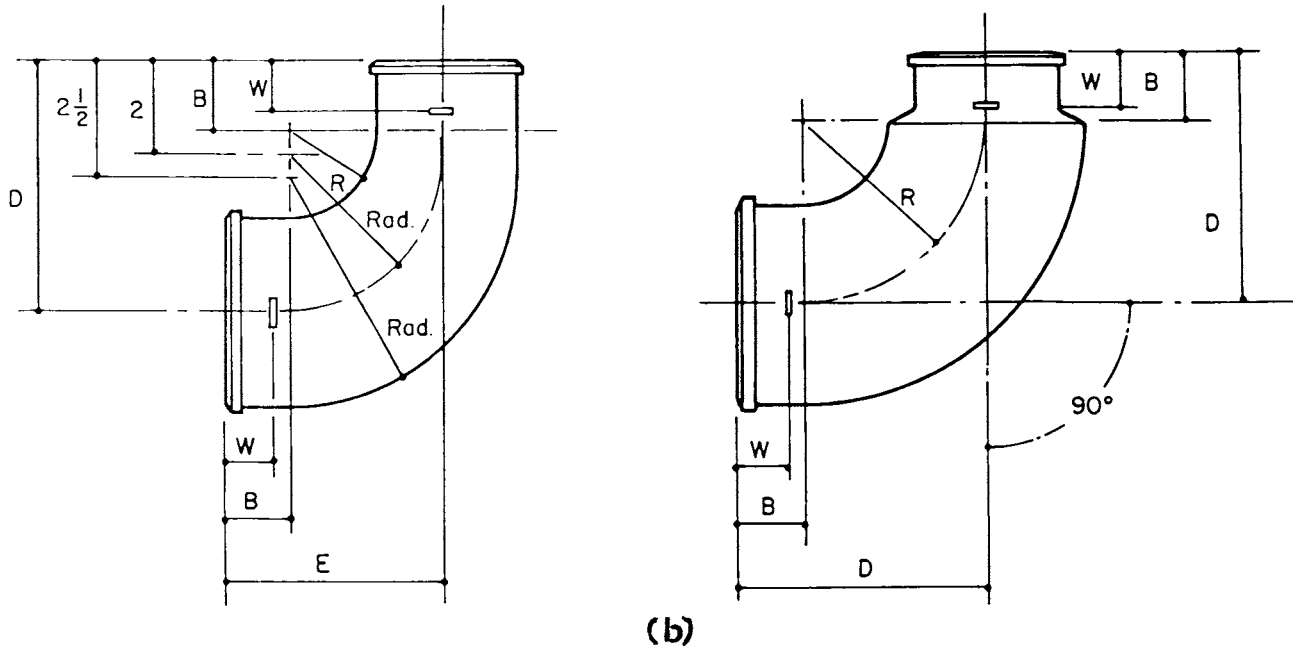
ASA Code Group 022		Size, in.	Dimensions, in. (mm) ^A			
Item No.	✓		B	$D^{B \pm 1/8}$ (3.2)	R	W
0188	7	1½	1½ (38)	4¼ (108)	2¾ (70)	1⅝ (29)
0190	3	2	1½ (38)	4½ (114)	3 (76)	1⅝ (29)
0192	9	3	1½ (38)	5 (127)	3½ (89)	1⅝ (29)
0194	5	4	1½ (38)	5½ (140)	4 (102)	1⅝ (29)
0196	0	5	2 (51)	6½ (165)	4½ (114)	1½ (38)
0198	6	6	2 (51)	7 (178)	5 (127)	1½ (38)
0200	0	8	2½ (64)	8½ (216)	6 (152)	2 (51)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.

^B Dimension D is laying length.

FIG. 5 ¼ Bend (corresponds to Table 5 of CISPI Specification 301)

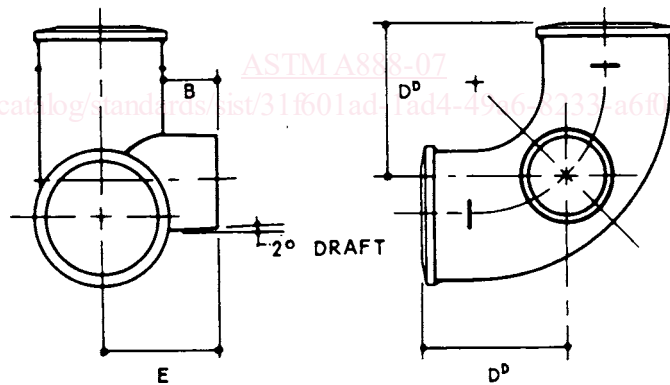
<https://standards.iteh.ai/catalog/standards/sist/31f601ad-1ad4-49a6-8233-a6f01ed33dc6/astm-a888-07>



ASA Code Group 022		Sizes, in.	Dimensions, in. (mm) ^A					
Item No.	√		B	R	D ^B ± 1/8 (3.2)	E ^B ± 1/8 (3.2)	W	
Fig. (a)	0218	2	4 by 3	1 1/2 (38)	3 1/2 (89)	5 1/2 (140)	5 (127)	1 1/8 (29)
Fig. (b)	0218	2	4 by 3	1 1/2 (38)	4 (102)	5 1/2 (140)	...	1 1/8 (29)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.
^B Dimensions D and E are laying lengths.

FIG. 6 Reducing 1/4 Bend (corresponds to Tables 6 and 7 of CISPI Specification 301)



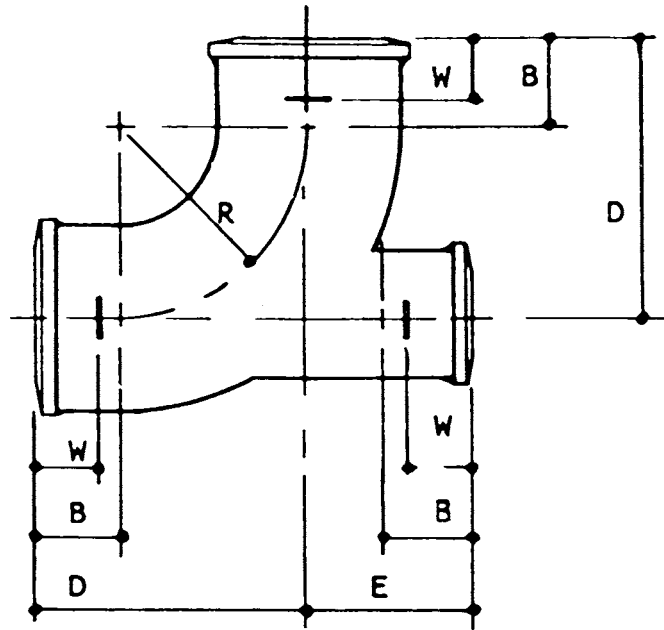
NOTE 1—For details of 1/4 bend, see Fig. 5.

NOTE 2—Inclusion of spigot bead and positioning lug optional with manufacturer based on casting method used.

ASA Code Group 022		Sizes, in.	Dimensions, in. (mm) ^A		
Item No.	√		B	E ^B ± 1/8 (3.2)	D ^B
0236	4	3 by 2	1 1/2 (38)	3 1/4 (83)	4 (102)
0238	0	4 by 2	1 1/2 (38)	3 3/4 (95)	4 5/16 (110)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.
^B Dimension E is laying length.

FIG. 7 1/4 Bend With Side Opening (corresponds to Table 8 of CISPI Specification 301)

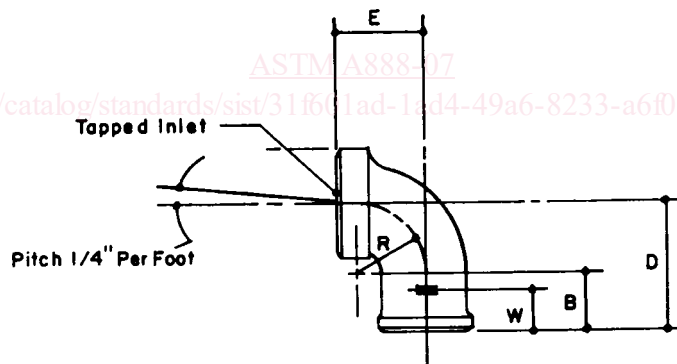


ASA Code Group 022		Size, in.	Dimensions, in. (mm) ^A				
Item No.	√		B	D ^B ± 1/8 (3.2)	E ^B ± 1/8 (3.2)	R	W
0280	2	3 by 2	1 1/2 (38)	5 (127)	2 7/8 (73)	3 1/2 (89)	1 1/8 (29)
0275	2	3 by 2	1 1/2 (38)	5 (127)	10 1/2 (267)	3 1/2 (89)	1 1/8 (29)
0282	8	4 by 2	1 1/2 (38)	5 1/2 (140)	3 1/4 (83)	4 (102)	1 1/8 (29)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.

^B Dimensions D and E are laying lengths.

FIG. 8 1/4 Bend With Heel Opening (corresponds to Table 9 of CISPI Specification 301)



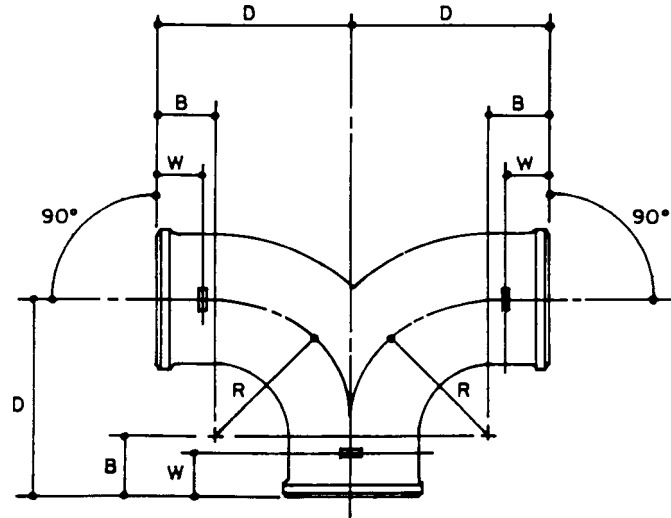
ASA Code Group 022		Size, in.	Dimensions, in. (mm) ^A					
Item No.	√		B	E	D ^B ± 1/8 (3.2)	R	IPS Tapping ^C	W
0324	8	1 1/2 by 1 1/4	1 1/2 (38)	2 (51)	3 (76)	1 3/4 (44)	1 1/4 (32)	1 1/8 (29)
0326	3	1 1/2 by 1 1/2	1 1/2 (38)	2 (51)	3 (76)	1 3/4 (44)	1 1/2 (38)	1 1/8 (29)
0328	9	2 by 1 1/4	1 1/2 (38)	2 1/4 (57)	3 1/4 (83)	1 3/4 (44)	1 1/4 (32)	1 1/8 (29)
0330	5	2 by 1 1/2	1 1/2 (38)	2 1/4 (57)	3 1/4 (83)	1 3/4 (44)	1 1/2 (38)	1 1/8 (29)
		2 by 2	1 1/2 (38)	2 1/4 (57)	3 1/4 (83)	1 3/4 (44)	2 (51)	1 1/8 (29)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.

^B Dimension D is laying length.

^C For details of tapping bosses, see Fig. 61.

FIG. 9 Tapped 1/4 Bend (corresponds to Table 11 of CISPI Specification 301)



ASA Code Group 022		Dimensions, in. (mm) ^A				
Item No.	√	Size, in.	D ^B ± 1/8 (3.2)	R	B	W
0402	2	2	4 1/2 (114)	3 (76)	1 1/2 (38)	1 1/8 (29)
0404	8	3	5 (127)	3 1/2 (89)	1 1/2 (38)	1 1/8 (29)
0406	3	4	5 1/2 (140)	4 (102)	1 1/2 (38)	1 1/8 (29)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.

^B Dimension D is laying length.

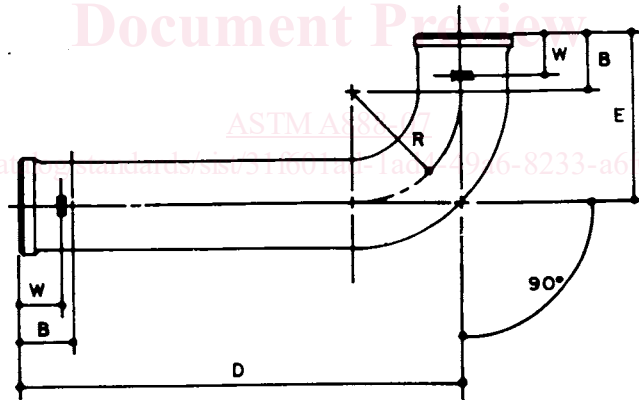
FIG. 10 Double 1/4 Bend (corresponds to Table 13 of CISPI Specification 301)

(<https://standards.iteh.ai>)

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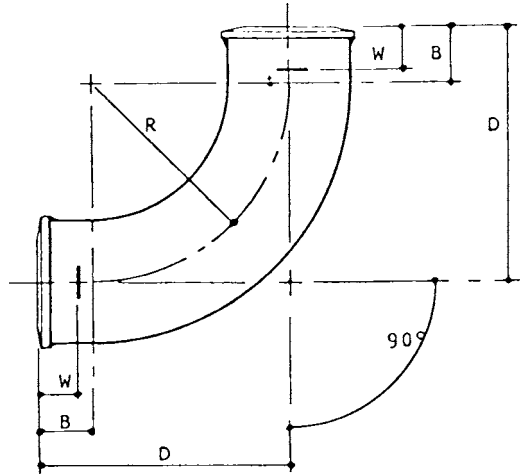


ASA Code Group 022		Size, in.	Dimensions, in. (mm) ^A				
Item No.	√		B	E ^B ± 1/8 (3.2)	D ^B ± 1/8 (3.2)	R	W
0424	6	2 by 12	1 1/2 (38)	4 1/2 (114)	12 (305)	3 (76)	1 1/8 (29)
		2 by 14	1 1/2 (38)	4 1/2 (114)	14 (356)	3 (76)	1 1/8 (29)
0423	8	2 by 16	1 1/2 (38)	4 1/2 (114)	16 (406)	3 (76)	1 1/8 (29)
		2 by 18	1 1/2 (38)	4 1/2 (114)	18 (457)	3 (76)	1 1/8 (29)
0425	3	2 by 24	1 1/2 (38)	4 1/2 (114)	24 (610)	3 (76)	1 1/8 (29)
		3 by 12	1 1/2 (38)	5 (127)	12 (305)	3 1/2 (89)	1 1/8 (29)
0426	1	3 by 18	1 1/2 (38)	5 (127)	18 (457)	3 1/2 (89)	1 1/8 (29)
0427	9	4 by 12	1 1/2 (38)	5 1/2 (140)	12 (305)	4 (102)	1 1/8 (29)
0428	7	4 by 18	1 1/2 (38)	5 1/2 (140)	18 (457)	4 (102)	1 1/8 (29)
0431	1	4 by 18	1 1/2 (38)	5 1/2 (140)	18 (457)	4 (102)	1 1/8 (29)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.

^B Dimensions D and E are laying lengths.

FIG. 11 Long 1/4 Bend (corresponds to Table 14 of CISPI Specification 301)



ASA Code Group 022		Size, in.	Dimensions, in. (mm) ^A			
Item No.	√		B	D ^{B±1/8} (3.2)	R	W
0462	6	2	1½ (38)	6½ (165)	5 (127)	1⅛ (29)
0464	2	3	1½ (38)	7 (178)	5½ (140)	1⅛ (29)
0468	3	4	1½ (38)	7½ (191)	6 (152)	1⅛ (29)
0470	9	5	2 (51)	8½ (216)	6½ (165)	1½ (38)
0472	5	6	2 (51)	9 (229)	7 (178)	1½ (38)
0474	1	8	2½ (64)	10½ (267)	8 (203)	2 (51)
0475	8	10	3 (76)	12 (305)	9 (229)	2 (51)
0476	8	12	3¼ (83)	13¼ (337)	10 (254)	2¾ (70)
0477	8	15	3¼ (83)	14¾ (375)	11½ (292)	2¾ (70)

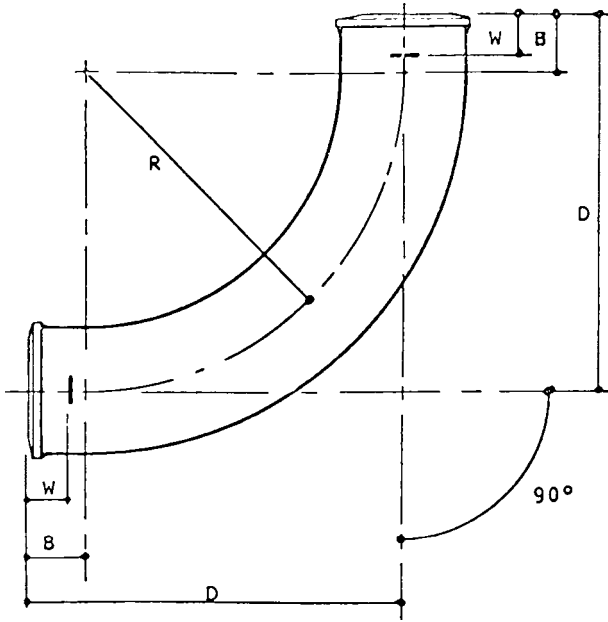
ASA Code Group 022		Size, in.	Extended Pattern Dimensions, in. (mm) ^A				
Item No.	√		B	D ^{B±1/8} (3.2)	E ^{B±1/8} (3.2)	R	W
0478	7	2 by 12	1½ [38]	6½ [165]	12 [305]	5 [127]	1⅛ [29]
0479	7	2 by 14	1½ [38]	6½ [165]	14 [356]	5 [127]	1⅛ [29]
0480	7	2 by 16	1½ [38]	6½ [165]	16 [406]	5 [127]	1⅛ [29]
0481	7	2 by 18	1½ [38]	6½ [165]	18 [457]	5 [127]	1⅛ [29]
0482	7	2 by 24	1½ [38]	6½ [165]	24 [610]	5 [127]	1⅛ [29]
0483	7	2 by 34	1½ [38]	6½ [165]	34 [864]	5 [127]	1⅛ [29]

Note: Dimensions D and E are laying lengths on extended pattern fittings.

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.

^B Dimension D is laying length.

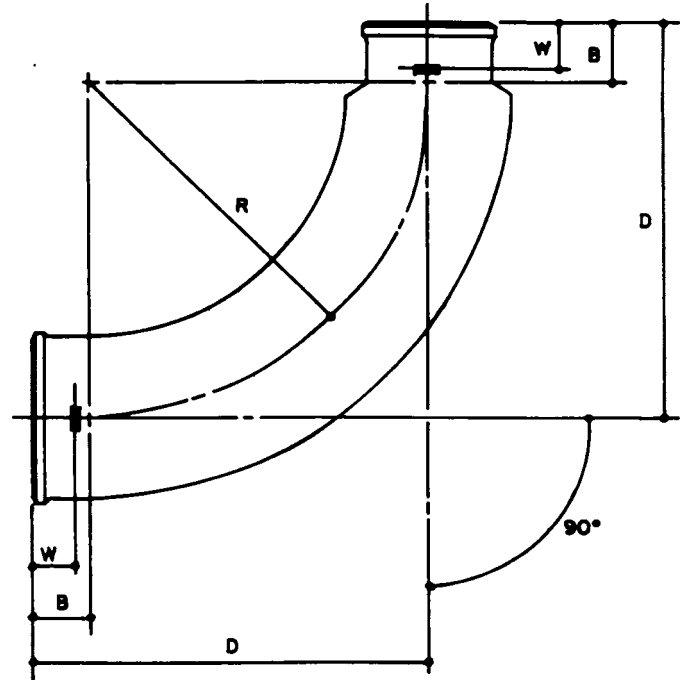
FIG. 12 Short Sweep (corresponds to Table 15 of CISPI Specification 301)



ASA Code Group 022		Dimensions, in. (mm) ^A				
Item No.	✓	Size, in.	B	D ^B ± 1/8 (3.2)	R	W
0492	3	1 1/2	1 1/2 (38)	9 1/4 (235)	7 3/4 (197)	1 1/8 (29)
0494	9	2	1 1/2 (38)	9 1/2 (241)	8 (203)	1 1/8 (29)
0496	4	3	1 1/2 (38)	10 (254)	8 1/2 (216)	1 1/8 (29)
0498	0	4	1 1/2 (38)	10 1/2 (267)	9 (229)	1 1/8 (29)
0500	3	5	2 (51)	11 1/2 (292)	9 1/2 (241)	1 1/2 (38)
0502	9	6	2 (51)	12 (305)	10 (254)	1 1/2 (38)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.
^B Dimension D is laying length.

FIG. 13 Long Sweep (corresponds to Table 17 of CISPI Specification 301)



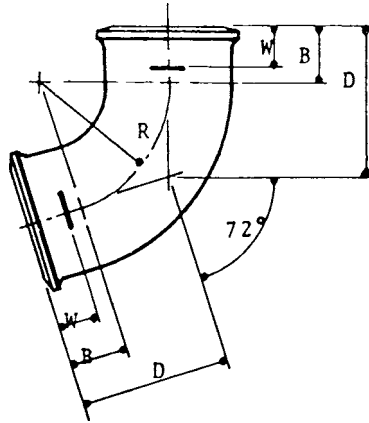
ASA Code Group 022		Dimensions, in. (mm) ^A				
Item No.	✓	Size, in.	B	D ^B ± 1/8 (3.2)	R	W
0518	5	4 by 3	1 1/2 (38)	10 1/2 (267)	9 (229)	1 1/8 (29)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.
^B Dimension D is laying length.

FIG. 14 Reducing Long Sweep (corresponds to Table 18 of CISPI Specification 301)

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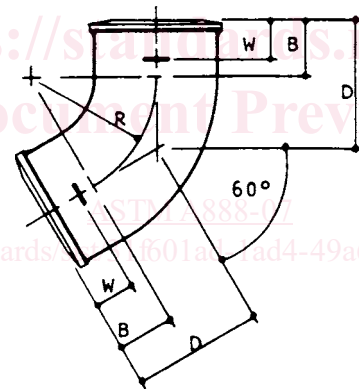
<https://standards.iteh.ai/catalog/standards/sist/31f601ad-1ad4-49a6-8233-a6f01ed33dc6/astm-a888-07>



ASA Code Group 022		Dimensions, in. (mm) ^A				
Item No.	√	Size, in.	B	D ^B ± 1/8 (3.2)	R	W
0536	7	2	1 1/2 (38)	3 1/16 (94)	3 (76)	1 1/8 (29)
0538	3	3	1 1/2 (38)	4 1/16 (103)	3 1/2 (89)	1 1/8 (29)
0540	9	4	1 1/2 (38)	4 7/16 (113)	4 (102)	1 1/8 (29)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.
^B Dimension D is laying length.

FIG. 15 1/8 Bend (corresponds to Table 19 of CISPI Specification 301)



ASA Code Group 022		Dimensions, in. (mm) ^A				
Item No.	√	Size, in.	B	D ^B ± 1/8 (3.2)	R	W
0570	6	2	1 1/2 (38)	3 1/4 (83)	3 (76)	1 1/8 (29)
0572	2	3	1 1/2 (38)	3 1/2 (89)	3 1/2 (89)	1 1/8 (29)
0574	8	4	1 1/2 (38)	3 13/16 (97)	4 (102)	1 1/8 (29)

^A For details of barrel, spigot, and gasket positioning lug, see Figs. 1 and 2.
^B Dimension D is laying length.

FIG. 16 1/8 Bend (corresponds to Table 20 of CISPI Specification 301)