



Designation: **A733—15 A733 – 16**

## Standard Specification for Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples<sup>1</sup>

This standard is issued under the fixed designation A733; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

### 1. Scope<sup>\*Scope</sup>

1.1 This specification covers the requirements for welded and seamless carbon steel pipe nipples, black and zinc-coated (hot-dip galvanized), and welded and seamless austenitic stainless steel pipe nipples in standard steel pipe sizes from 1/8 to 12 in. inclusive, in standard or special lengths.

1.1.1 *Welded Carbon Steel*—Pipe nipples ordered under these requirements are intended for general uses, as described by Specification **A53/A53M** or for low-temperature service as described by Specification **A333/A333M**.

1.1.2 *Seamless Carbon Steel*—Pipe nipples ordered under these requirements are intended for general and special uses, as described by the applicable Specifications **A53/A53M** and **A106/A106M** or for low temperature service as described by Specification **A333/A333M** (see 4.1.1).

1.1.3 *Austenitic Stainless Steel*—Pipe nipples ordered under these requirements are intended for high-temperature and general corrosion service, as described by Specification **A312/A312M** (see 4.1.2).

1.1.4 The text for this specification contains notes or footnotes, or both, that provide explanatory material. Such notes and footnotes, excluding those in tables, do not contain any mandatory language.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>2</sup>

**A53/A53M** Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

**A106/A106M** Specification for Seamless Carbon Steel Pipe for High-Temperature Service

**A312/A312M** Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

**A333/A333M** Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness

#### 2.2 American National Standards Institute Standards:<sup>3</sup>

**B1.20.1** Pipe Threads, General Purpose

**B36.10** Standard for Welded and Seamless Wrought Steel Pipe

**B36.19** Standard for Stainless Steel Pipe

### 3. Ordering Information

3.1 Information items to be considered, if appropriate, for inclusion in purchase orders are as follows:

3.1.1 Quantity (pieces),

3.1.2 Name of material (carbon steel or austenitic stainless steel pipe nipples) (see 4.1.1 and 4.1.2),

3.1.2.1 Carbon steel applications should identify low-temperature or high-temperature service, if applicable.

3.1.3 Method of pipe manufacture (continuous-welded, electric-resistance welded, or seamless) (see 4.1.1, **Note 1**),

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.09 on Carbon Steel Tubular Products.

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<sup>2</sup> 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.

<sup>3</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

**\*A Summary of Changes section appears at the end of this standard**

- 3.1.4 Type and grade (if stainless steel),
- 3.1.5 Finish (carbon steel, black or galvanized),
- 3.1.6 Size (nominal and weight class or schedule number as shown in **Table 1**, or outside diameter and nominal wall),
- 3.1.7 Length (standard or special, see **4.3**),
- 3.1.8 Specification number,
- 3.1.9 Certification of compliance, if required, and
- 3.1.10 Special requirements or exceptions to this specification.

3.2 In addition, when material is purchased for agencies of the U.S. Government, it shall conform to the Supplementary Requirements as defined herein when specified in the contract or purchase order.

**4. Requirements**

4.1 *Material and Weight*—Pipe nipples covered by this specification shall be made from new, hydrostatic-tested or NDE-tested pipe conforming to the requirements specified in **4.1.1** and **4.1.2**.

4.1.1 *Carbon Steel*—Carbon steel pipe nipples shall be in accordance with the following:

Method of Pipe Manufacture	Specification
<u>Welded (Note 1)</u>	<b>A53/A53M</b>
	<b>A333/A333M</b>
<u>Welded</u>	<b>A53/A53M</b>
	<b>A333/A333M</b>
<u>Seamless (Note 2)</u>	<b>A53/A53M</b>
	<b>A106</b>
	<b>A333/A333M</b>
<u>Seamless</u>	<b>A53/A53M</b>
	<b>A106/A106M</b>
	<b>A333/A333M</b>

NOTE 1—Unless otherwise specified, continuous-welded nipples are furnished in sizes NPS 4 and under for standard and extra strong pipe, and NPS 2½ and under for Schedule 160 and double extra strong pipe. Welded nipples in sizes larger than that indicated for continuous-welded are electric resistance-welded.

4.1.2 *Austenitic Stainless Steel*—Austenitic stainless steel pipe nipples shall be in accordance with Specification **A312/A312M**.

4.2 *Threads*—Pipe nipples shall be threaded on both ends with NPT taper pipe threads conforming to the requirements of ANSI B 1.20.1, except for “close” nipples where L 4 and V are shorter, due to fewer imperfect threads. It is standard manufacturing practice on all other nipple lengths to vary L 4 plus or minus two threads. All other dimensions, tolerances, and gaging practices remain the same as ANSI B 1.20.1, plus **5.3** of this specification.

4.2.1 Threads shall be right-hand on both ends, except when otherwise specified.

4.3 *Lengths:*

4.3.1 The standard lengths and sizes of nipples generally available are shown in **Table 2**. The availability of such nipples according to pipe size and weight is shown in **Table 1**.

4.3.2 Special lengths and sizes of nipples may be specified when required. Standard and special lengths shall conform to the tolerance requirements of **4.3.3**.

4.3.3 Nipples with lengths up through 12 in. (304.8 mm) long shall have a length tolerance of ± 1/16 in. (1.6 mm). Nipples over 12 in. long shall have a tolerance of ± 1/8 in. (3.2 mm).

4.4 *End Finish*—The ends of the pipe nipples shall be chamfered on the outside at an angle of 35 ± 10° to the central axis. (It is the standard practice that the 1/8-in. (3.2-mm) nominal pipe size nipples are not chamfered.) Ends shall be cut reasonably square to the central axis. All burrs on the inside shall be removed.

**TABLE 1 Pipe Nipple Sizes According to Weight of Nominal Pipe Sizes<sup>AB</sup>**

Weight	NPS Designator						
	1/8	1/4	3/8	1/2 to 6	8	10	12
Standard (Schedule 40)	X	X	X	X	X	X	<sup>C</sup>
Extra strong (Schedule 80)	X	X	X	X	X	<sup>D</sup>	<sup>C</sup>
Schedule 160	...	...	...	X	X	X	X
Double extra strong	...	...	...	X	X	X	X

<sup>A</sup> A comprehensive listing of standardized pipe dimensions is contained in ANSI B36.10 and B36.19.

<sup>B</sup> Continuous-welded pipe is not made in sizes larger than NPS 4 (standard and extra strong) and larger than NPS 2½ (Schedule 160 and double extra strong).

<sup>C</sup> NPS 12 standard and extra strong weight pipe do not have designated schedule numbers.

<sup>D</sup> NPS 10 extra strong pipe is Schedule 60, not Schedule 80.

**TABLE 2 Pipe Nipples by Length and Nominal Pipe Size**

Type of Nipple	NPS Designator																	
	1/8	1/4	3/8	1/2	5/8	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12
	Pipe Nipple Lengths, in. <sup>A,B</sup>																	
Close (cl)	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8	3 1/2	3 5/8	4 1/2
1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2													
2	2	2	2	2	2	2	2	2										
2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2									
3	3	3	3	3	3	3	3	3	3	3	3							
3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3	3 1/2	3 1/2	3 1/2							
4	4	4	4	4	4	4	4	4	4	4	4	4	4					
4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2			
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Right and left	...	...	4	4	4	4	4	4	4	4	4	4	...	...	...	...	...	...

<sup>A</sup> Nipples shorter than close are not recommended for pressure application.

<sup>B</sup> 1 in. = 25.4 mm.

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4.5 *Galvanized Nipples*—Galvanized nipples ordered under this specification shall be made from pipe coated on the inside and outside by the hot-dip process. Threads and nipple ends are not galvanized.

**5. Sampling and Inspection**

5.1 *Sampling*—Samples of nipples sufficient to determine their conformance with the requirements of this specification shall be taken at random for each lot of nipples of the same pipe size, length, and material.

5.2 *Inspection*—The samples shall be inspected to determine their conformance with the dimensional requirements, including thread dimensions and finish of this specification.

5.3 *Gaging Techniques for Male Threads:*

5.3.1 An NPT working ring gage, in accordance with ANSI B1.20.1, shall be turned hand tight on the nipple threads. The gage shall be tapped or rapped against a solid surface and the gage again turned hand tight into the thread. Hand tight means turning the gage until moderate resistance is encountered; no excessive force shall be used. After the second tightening operation, the end of the thread should be flush to the gage face, plus or minus one turn.

5.3.2 The reference point for gaging is the end of the thread provided the chamfer is not smaller than the minor diameter of the external thread. When a chamfer on the external thread exceeds this limit, the reference point becomes the last thread scratch on the chamfer cone.

5.3.3 The usual technique for tapping or rapping the gage is to swing the end of the fitting with the ring gage attached through an arc of approximately 4 to 6 in. (100 to 150 mm) to allow the gage to strike against a solid metal surface. This tapping procedure is used to eliminate any binding due to slight nicks or foreign matter in the threads.

NOTE 1—Any mechanical device that simulates the gage tapping or rapping to achieve the same results is also permitted.

5.4 The inspector representing the purchaser shall have entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works that concern the manufacture of the nipples ordered. The manufacturer shall afford the inspector all reasonable facilities to satisfy him that the nipples are being furnished in accordance with this specification.