Designation: A 733 – 03

Standard Specification for Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples[1]

This standard is issued under the fixed designation A 733; 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.

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

1. Scope

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 ⅛to 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 A 53.

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 A 53 and A 106 (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 A 312 (see 4.1.2).

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

2. Referenced Documents

2.1 *ASTM Standards:*

A 53 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless[2]

A 106 Specification for Seamless Carbon Steel Pipe for High-Temperature Service[2]

A 312 Specification for Seamless and Welded Austenitic Stainless Steel Pipes[2]

2.2 *American National Standards Institute Standards:*[3]

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),

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

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
Welded (Note 1)	A 53
Seamless (Note 2)	A 53
	A 106

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.

[1] 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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[2] *Annual Book of ASTM Standards*, Vol 01.01.

[3] Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.

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TABLE 1 Pipe Nipple Sizes According to Weight of Nominal Pipe Sizes[A,B]

Weight	NPS Designator						
	⅛	¼	⅜	½ to 6	8	10	12
Standard (Schedule 40)	X	X	X	X	X	X	[C]
Extra strong (Schedule 80)	X	X	X	X	X	[D]	[C]
Schedule 160	...	...	...	X	X	X	X
Double extra strong	...	...	...	X	X	X	X

[A] A comprehensive listing of standardized pipe dimensions is contained in ANSI B36.10 and B36.19.

[B] 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).

[C] NPS 12 standard and extra strong weight pipe do not have designated schedule numbers.

[D] NPS 10 extra strong pipe is Schedule 60, not Schedule 80.

4.1.2 *Austenitic Stainless Steel*—Austenitic stainless steel pipe nipples shall be in accordance with Specification A 312.

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 ± ⅛ 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 ⅛-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.

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.

TABLE 2 Pipe Nipples by Length and Nominal Pipe Size

Type of Nipple	NPS Designator																	
	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12
	Pipe Nipple Lengths, in.[A,B]																	
Close (cl)	¾	⅞	1	1⅛	1⅜	1½	1⅝	1¾	2	2½	2⅝	2¾	2⅞	3	3⅛	3½	3⅞	4½
	1½	1½	1½	1½	1½													
	2	2	2	2	2	2	2	2										
	2½	2½	2½	2½	2½	2½	2½	2½	2½									
	3	3	3	3	3	3	3	3	3	3	3							
	3½	3½	3½	3½	3½	3½	3½	3	3½	3½	3½							
	4	4	4	4	4	4	4	4	4	4	4	4	4					
	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½			
	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	
	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
	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
	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
	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
	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
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	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
	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	...	...	...	...	...	...	...

[A] Nipples shorter than close are not recommended for pressure application.

[B] 1 in. = 25.4 mm.

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TABLE 3 Dash numbers for standard and extra strong steel pipe nipples

NOMINAL PIPE SIZE	⅛	¼	⅜	½	¾	1	1-¼	1-½	2	2-½	3	4	5	6
A OUTSIDE DIA., in.[A]	.405	.540	.675	.840	1.050	1.315	1.660	1.900	2.375	2.875	3.500	4.500	5.563	6.625
B THICKNESS:, in.[A]														
(STANDARD)	.068	.088	.091	.109	.113	.133	.140	.145	.154	.203	.216	.237	.258	.280
(EXTRA STRONG)	.095	.119	.126	.147	.154	.179	.191	.200	.218	.276	.300	.337	.375	.432
L LENGTH ±1/16 IN.[A]	DASH NUMBERS													
¾	[A]1													
⅞		[B]25												
1			[B]49											
1-⅛				[B]73										
1-⅜					[B]97									
1-½	[C]6	[C]29	[C]52	[C]75		[B]121								
1-⅝							[B]145							
1-¾							[B]169							
2	9	32	55	78	[C]101	[C]124			[B]193					
2-½	10	33	56	79	102	125	[C]148	[C]171	[C]194	[B]217				
3	11	34	57	80	102	126	149	172	195	[C]218	[C]241			
3-½	12	35	58	81	104	127	150	173	196	219	242			
4	13	36	59	82	105	128	151	174	197	220	243			
4-½	14	37	60	83	106	129	152	175	198	221	244		[C]290	[C]313
5	15	38	61	84	107	130	153	176	199	222	245			
5-½	16	39	62	85	108	131	154	177	200	223	246			
6	17	40	63	86	109	132	155	178	201	224	247	270		316
7	18	41	64	87	110	133	156	179	202	225	248			
8	19	42	65	88	111	134	157	180	203	226	249			
9	20	43	66	89	112	135	158	181	204	227	250			
10	21	44	67	90	113	136	159	182	205	228	251			
11	22	45	68	91	114	137	160	183	206	229	252			
12	23	46	69	92	115	138	161	184	207	230	253			

Notes:

[A] 1 in. = 25.4 mm
[B] Close type nipples
[C] Short (shoulder) type nipples

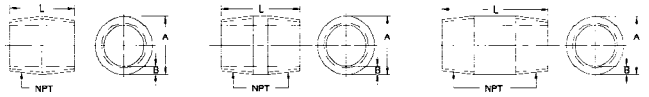

FIG. 1 Standard and Extra Strong Steel Pipe Nipples

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 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 2—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. Inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

6. Rejection

6.1 Each nipple that fails to meet the requirement of this specification shall be rejected, and the manufacturer notified.

7. Certification

7.1 When requested at the time the order is placed, the manufacturer shall provide certification that the nipples comply to all the requirements of this specification.

7.2 The nipple manufacturer shall maintain a record on pipe mill test report certifications.

8. Identification and Packaging

8.1 Individual nipples are not normally identified. Packaged nipples shall have their containers legibly marked to show the brand or name of manufacturer, size, length, quantity, method of pipe manufacture, type and grade of material (if other than carbon steel), ASTM A 733, and finish.

8.2 At manufacturer's option, large size, extra long nipples, and odd lots are bagged or bundled with tags identifying the product in accordance with 8.1.

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9. Keywords

9.1 carbon steel fittings; pipe fittings; pipe nipples; stainless steel fittings

SUPPLEMENTARY REQUIREMENTS

The following supplementary requirements shall apply only when specified by the purchaser in the inquiry, contract, or order, for agencies of the U.S. Government.

S1.1 *Part Numbering System*—This supplement provides a part numbering system for identification of standard items for government use of Specification A 733. (See also Table 3 and Fig. 1).

NOTE S1.1—The government encourages the general use of this part numbering system to achieve maximum parts standardization.

S1.2 The part number consists of the document identifier followed by the code for the weight of material (standard or extra strong), a dash, dash number, material code, method of manufacture code, and finish code (see example).

S1.2.1 *Example*—Part Identifying Number "A733S–198CFB" is constructed as follows in Fig. S1:

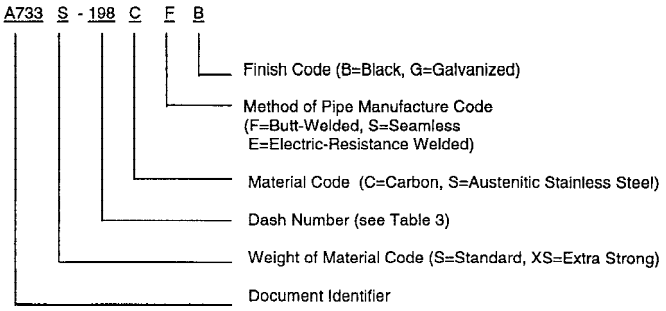

FIG. S1 Construction of Part Identifying Number

SUMMARY OF CHANGES

Committee A01 has identified the location of selected changes to this standard since the last edition (A 733-01) that may impact the use of this standards (approved April 2003).

(1) 4.1was revised to permit the use of NDE-tested pipe.

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