ASME B36.19M-2004

(Revision of ANSI/ASME B36.19M-1985)

Stainless Steel Pipe

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

The American Society of
Mechanical Engineers

AN AMERICAN NATIONAL STANDARD

STAINLESS STEEL PIPE

ASME B36.19M-2004

(Revision of ANSI/ASME B36.19M-1985)

Date of Issuance: October 25, 2004

This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

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

CONTENTS

FOREWORD

This Standard for corrosion resistant piping, designated categorically as *stainless,* is based on the same principles that formed the background for the development of ASME B36.10M, Welded and Seamless Wrought Steel Pipe, and reference is made to this source of information.

The more recent development of the highly alloyed stainless steels has brought about a minor conflict with convention. With these newer materials, the need for standards is just as great and the present types of threads are just as satisfactory, but the basic cost of the metal is much higher and the art of fusion welding has developed concurrently. The character of stainless steel permits the design of thin-wall piping systems without fear of early failure due to corrosion, and the use of fusion welding to join such piping has eliminated the necessity of threading it. For these reasons, the wall thickness dimensions shown under Schedule 10S have been developed, based on the conventional formula, but then modified to correspond to the nearest Birmingham Wire Gage (B.W.G.) number.

Following publication of the 1949 edition, a demand developed for a still lighter wall pipe. A Schedule 5S was determined cooperatively by representatives of chemical companies, processing industries, and manufacturers of welding fittings. This was endorsed by the American Standards Association (ASA) Chemical Industry Correlating Committee and the Manufacturers Standardization Society of the Valve and Fittings Industry. The new schedule was included in the revised standard that was approved by ASA (now ANSI) on April 7, 1952.

In 1956, it was recommended that the wall thickness of 12 in. 5S be lessened, and a new revision of the standard was issued shortly after its approval by ASA on February 27, 1957. In this fourth edition, dimensions were expanded beyond 12 in. pipe size by inclusion of, and reference to, ASTM Specification A 409. This revision was approved by ASA on October 29, 1965.

The B36 Standards Committee membership was asked in March 1970 for recommendations as to what action should be taken on ANSI B36.19-1965 since, according to ANSI procedures, this standard was due for revision or affirmation. The B36 Standards Committee recommended reaffirmation. This action was approved by the Secretariat and by the American National Standards Institute on May 26, 1971.

In 1975, the B36 Standards Committee undertook a review of the standard, considering its acceptability and usefulness. The results were favorable; some editorial refinements and updating were proposed, along with the incorporation of factors for conversion to SI (metric) units. The revision was approved by the Standards Committee, the Secretariat, and subsequently the American National Standards Institute on October 4, 1976.

The standard was revised in 1984 to include SI (metric) dimensions. The outside diameters and wall thicknesses were converted to millimeters by multiplying the inch dimensions by 25.4. Outside diameters larger than 16 in. were rounded to the nearest 1 mm, and outside diameters 16 in. and smaller were rounded to the nearest 0.1 mm. Wall thicknesses were rounded to the nearest 0.01 mm. These converted and rounded SI dimensions were added in Table 2A. A formula to calculate the SI plain end mass, kg/m, using SI diameters and thicknesses, was added to para. 5. The SI plain end mass was calculated for each size and thickness, and added in Table 3A. These changes in the standard were approved by the Standards Committee, the Sponsor, and ANSI, and it was designated an American National Standard on October 7, 1985.

The current edition revises the text to conform to the format and content, as appropriate, of ASME B36.10M-2004. Tables 2, 2A, 3, and 3A are replaced with a new Table 1, combining the information in the previous tables into a single table. Also, the roster of the disbanded B36 Committee is replaced by the roster of the B32 Committee. This edition was approved as an American National Standard on June 23, 2004.

ASME B32 COMMITTEE
Metal and Metal Alloy
Wrought Mill Product Nominal Sizes

(The following is the roster of the Committee at the time of approval of this Standard.)

OFFICERS

J. A. Gruber, *Chair*
J. H. Karian, *Secretary*

COMMITTEE PERSONNEL

F. M. Christensen, F. M. Christensen Metallurgical Consulting, Inc.
A. Cohen, Arthur Cohen & Associates
J. A. Gruber, Wheatland Tube Co.
W. N. Holliday, LTV Steel Co.
L. T. Ingels, American Gas Association, Inc.
J. H. Karian, The American Society of Mechanical Engineers
K. O. Kverneland, Kok Metric Co.
A. R. Machell, Jr.
P. Pollak, Aluminum Association, Inc.
R. N. Rau

STAINLESS STEEL PIPE

1 SCOPE

This Standard covers the standardization of dimensions of welded and seamless wrought stainless steel pipe for high or low temperatures and pressures.

The word *pipe* is used, as distinguished from *tube,* to apply to tubular products of dimensions commonly used for pipeline and piping systems. Pipes NPS 12 (DN 300) and smaller have outside diameters numerically larger than their corresponding sizes. In contrast, the outside diameters of tubes are numerically identical to the size number for all sizes.

The wall thicknesses for NPS 14 through 22, inclusive (DN 350–550, inclusive), of Schedule 10S; NPS 12 (DN 300) of Schedule 40S; and NPS 10 and 12 (DN 250 and 300) of Schedule 80S are not the same as those of ASME B36.10M. The suffix "S" in the schedule number is used to differentiate B36.19M pipe from B36.10M pipe. ASME B36.10M includes other pipe thicknesses that are also commercially available with stainless steel material.

2 SIZE

The size of all pipe in Table 1 is identified by the nominal pipe size.

The manufacture of pipe NPS $\frac{1}{8}$ (DN 6) through NPS 12 (DN 300), inclusive, is based on a standardized outside diameter (OD). This OD was originally selected so that pipe with a standard OD and having a wall thickness that was typical of the period would have an inside diameter (ID) approximately equal to the nominal size. Although there is no such relation between the existing standard thicknesses — OD and nominal size — these nominal sizes and standard ODs continue in use as "standard."

The manufacture of pipe NPS 14 (DN 350) and larger proceeds on the basis of an OD corresponding to the nominal size.

3 MATERIALS

The dimensional standards for pipe described here are for products covered in ASTM specifications.

4 WALL THICKNESS

The nominal wall thicknesses are given in Table 1.

5 WEIGHTS

The nominal weights[1] of steel pipe are calculated values and are tabulated in Table 1.

(a) The nominal plain end weight, in pounds per foot, is calculated using the following formula:

$$W_{pe} = 10.69(D - t)t$$

where

D = outside diameter to the nearest 0.001 in. (the symbol D is used for OD only in mathematical equations or formulas)

W_{pe} = nominal plain end weight, rounded to the nearest 0.01 lb / ft

t = specified wall thickness, rounded to the nearest 0.001 in.

(b) The nominal plain end mass, in kilograms per meter, is calculated using the following formula:

$$W_{pe} = 0.0246615(D - t)t$$

where

D = outside diameter to the nearest 0.1 mm for outside diameters that are 16 in. (406.4 mm) and smaller, and 1.0 mm for outside diameters larger than 16 in. (the symbol D is used for OD only in mathematical equations or formulas)

W_{pe} = nominal plain end mass, rounded to the nearest 0.01 kg / m

t = specified wall thickness, rounded to the nearest 0.01 mm

6 PERMISSIBLE VARIATIONS

Variations in dimensions differ depending upon the method of manufacture employed in making the pipe to the various specifications available. Permissible variations for dimensions are indicated in each specification.

7 PIPE THREADS

Unless otherwise specified, the threads of threaded pipe shall conform to ANSI / ASME B1.20.1, Pipe Threads, General Purpose (Inch).

[1] The different grades of stainless steel have different specific densities and hence may weigh more or less than the values listed in Table 1 would indicate [see Table 1, General Note (e)].