



Standard Specification for Carbon Steel Forgings for Piping Applications¹

This standard is issued under the fixed designation A 105/A105M; 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 specification² covers forged carbon steel piping components for ambient- and higher-temperature service in pressure systems. Included are flanges, fittings, valves, and similar parts ordered either to dimensions specified by the purchaser or to dimensional standards such as the ANSI and API specifications referenced in Section 2. Forgings made to this specification are limited to a maximum weight of 10 000 lb [4540 kg]. Larger forgings may be ordered to Specification A 266. Tubesheets and hollow cylindrical forgings for pressure vessel shells are not included within the scope of this specification. Although this specification covers some piping components machined from rolled bar and seamless tubular products, (see 4.4) it does not cover raw material produced in these product forms.

1.2 Supplementary requirements are provided for use when additional testing or inspection is desired. These shall apply only when specified individually by the purchaser in the order.

1.3 Specification A 266/A 266M covers other steel forgings and Specifications A 675, A 695, and A 696 cover other steel bars.

1.4 This specification is expressed in both inch-pound units and SI units. However, unless the order specifies the applicable “M” specification designation (SI units), the material shall be furnished to inch-pound units.

1.5 The values stated in either inch-pound units or SI are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

NOTE 1—The dimensionless designator NPS (nominal pipe size) has been substituted in this standard for such traditional terms as “nominal diameter,” “size,” and “nominal size.”

2. Referenced Documents

2.1 ASTM Standards:

A 266/A 266M Specification for Carbon Steel Forgings for Pressure Vessel Components³

A 275/A 275M Test Method for Magnetic Particle Examination of Steel Forgings³

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products^{3,4,5}

A 675 Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties³

A 695 Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, for Fluid Power Applications³

A 696 Specification for Steel Bars, Carbon, Hot-Wrought or Cold-Finished, Special Quality, for Pressure Piping Components³

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products^{3,4,5}

A 788 Specification for Steel Forgings, General Requirements³

E 165 Test Method for Liquid Penetrant Examination⁶

E 340 Test Method for Macroetching Metals and Alloys⁷

2.2 MSS Standards:

SP-25 Standard Marking System for Valves, Fittings, Flanges and Unions⁸

SP 44 Standard for Steel Pipe Line Flanges⁸

2.3 ASME Standards:

Section IX, Welding Qualifications, ASME Boiler and Pressure Vessel Code⁹

B16.5 Dimensional Standards for Steel Pipe Flanges and Flanged Fittings⁹

B16.9 Wrought Steel Buttwelding Fittings⁹

B16.10 Face-to-Face and End-to-End Dimensions of Ferrous Valves⁹

B16.11 Forged Steel Fittings, Socket Weld, and Threaded⁹

¹ This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.22 on Valves, Fittings, Bolting, and Flanges for High Sub-atmospheric Temperatures.

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² For ASME Boiler and Pressure Vessel Code applications see related Specification SA-105 in Section II of that Code.

³ Annual Book of ASTM Standards, Vol 01.05.

⁴ Annual Book of ASTM Standards, Vol 01.01.

⁵ Annual Book of ASTM Standards, Vol 01.03.

⁶ Annual Book of ASTM Standards, Vol 03.03.

⁷ Annual Book of ASTM Standards, Vol 03.01.

⁸ Available from Manufacturers' Standardization Society of the Valve and Fittings Industry, 1815 N. Fort Myer Drive, Arlington, VA 22209.

⁹ Available from American Society of Mechanical Engineers, 345 E. 47th St., New York, NY 10017.