



Designation: A181/A181M – 23

Standard Specification for Carbon Steel Forgings, for General-Purpose Piping¹

This standard is issued under the fixed designation A181/A181M; 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 U.S. Department of Defense.

1. Scope*

1.1 This specification² covers nonstandard as-forged fittings, valve components, and parts for general service. Forgings made to this specification are limited to a maximum weight of 10 000 lb [4540 kg]. Larger forgings may be ordered to Specification [A266/A266M](#).

1.2 Two classes of material are covered, designated as Classes 60 and 70, respectively, and are classified in accordance with their mechanical properties as specified in [6.1](#).

1.3 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.

1.4 The values stated in either inch-pound units or SI units 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.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

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 [A01.22](#) on Steel Forgings and Wrought Fittings for Piping Applications and Bolting Materials for Piping and Special Purpose Applications.

Current edition approved May 1, 2023. Published May 2023. Originally approved in 1935. Last previous edition approved in 2022 as A181/A181M – 22. DOI: 10.1520/A0181_A0181M-23.

² For ASME Boiler and Pressure Vessel Code applications see related Specification SA-181 in Section II of that Code.

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.

[A266/A266M](#) Specification for Carbon Steel Forgings for Pressure Vessel Components

[A788/A788M](#) Specification for Steel Forgings, General Requirements

[A961/A961M](#) Specification for Common Requirements for Steel Flanges, Forged Fittings, Valves, and Parts for Piping Applications

3. General Requirements and Ordering Information

3.1 Product furnished to this specification shall conform to the requirements of Specification [A961/A961M](#), including any supplementary requirements that are indicated in the purchase order. Failure to comply with the requirements of Specification [A961/A961M](#) constitutes non-conformance with this specification.

3.2 It is the purchaser’s responsibility to specify in the purchase order all ordering information necessary to purchase the needed material. Examples of such information include but are not limited to the ordering information in Specification [A961/A961M](#) and the following:

3.2.1 Supplementary requirements, and

3.2.2 Additional requirements (See [4.4](#), [9.1](#), [11.2](#), [13.1](#), and [13.2](#)).

3.3 If the requirements of this specification are in conflict with the requirements of Specification [A961/A961M](#), the requirements of this specification shall prevail.

4. Materials and Manufacture

4.1 Flanges, elbows, return bends, tees, and header tees shall not be machined directly from bar stock.

4.2 Hollow parts may be machined from hot-rolled or forged bar or hollow bar, provided the longitudinal axis of the part is parallel to the longitudinal axis of the bar. Other parts, up to and including NPS 4, may be machined from hot-rolled or forged bar provided the longitudinal axis of the part is parallel to the longitudinal axis of the bar.

4.3 Except as permitted in [4.2](#), the finished product shall be a forging as defined in the Terminology section (exclusively) of Specification [A788/A788M](#).

4.4 When specified in the order, the manufacturer shall submit for approval of the purchaser a sketch showing the shape of the rough forging before machining.

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