



Standard Specification for Titanium-Stabilized Carbon Steel Forgings for Glass-Lined Piping and Pressure Vessel Service¹

This standard is issued under the fixed designation A 836/A836M; 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.

1. Scope

1.1 This specification covers nonstandard as-forged fittings, valve components, and parts for glass-lined piping and pressure vessel service. Mechanical properties are certified on the basis of test material subjected to heat treatments to simulate glass-coating operations.

1.2 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. The inch-pound units shall apply unless the “M” designation of this specification is specified in the order.²

2. Referenced Documents

2.1 ASTM Standards:

A 275/A275M Test Method for Magnetic Particle Examination of Steel Forgings³

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products⁴

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment³

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products⁴

A 788 Specification for Steel Forgings, General Requirements³

E 165 Test Method for Liquid Penetrant Examination⁵

E 709 Guide for Magnetic Particle Examination⁵

2.2 ASME Boiler and Pressure Vessel Code:

Section IX Welding Qualifications⁶

2.3 Military Standard:

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage⁷

3. Ordering Information

3.1 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 following:

3.1.1 Quantity,

3.1.2 Dimensions (Tolerance and surface finishes should be included),

3.1.3 Specification number and class (The year date should be included),

3.1.4 Supplementary requirements, and

3.1.5 Additional requirements (see 10.1, 13.1, 13.2, 13.3, and 15.2).

4. Materials and Manufacture

4.1 Material for forgings shall consist of ingots, or forged, rolled, or strand cast blooms, billets, slabs, or bars.

4.2 The material shall be forged by hammering, pressing, rolling, extruding, or upsetting, such that the finished product will be a forging as defined in the Terminology Section of Specification A 788.

4.3 A sufficient discard shall be made from the source material to secure freedom from injurious piping and undue segregation.

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

4.5 Forgings shall be protected against sudden or too rapid cooling from the rolling or forging while passing through the critical range.

4.6 Heat treatment of forgings is neither required nor prohibited. However, the test material for qualifying the forging or the welding procedure shall be heat treated to simulate glass-coating operations.

5. Chemical Composition

5.1 *Cast or Heat Analysis*—An analysis of each cast or heat shall be made by the manufacturer to determine the percentages of the elements specified in Table 1. The analysis shall be

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 and Subatmospheric Temperatures.

Current edition approved June 15, 1995. Published August 1995. Originally published as A 836 – 84. Last previous edition A 836/A 836M – 95a.

² *Annual Book of ASTM Standards*, Vol 03.05.

³ *Annual Book of ASTM Standards*, Vol 01.05.

⁴ *Annual Book of ASTM Standards*, Vol 01.03.

⁵ *Annual Book of ASTM Standards*, Vol 03.03.

⁶ Available from American Society of Mechanical Engineers, 345 E. 47 St., New York, NY, 10017.

⁷ Available from U.S. Government Printing Office, Washington, DC 20402.