



Standard Specification for Steel Forgings, Austenitic, for Pressure and High Temperature Parts¹

This standard is issued under the fixed designation A 965/A 965M; 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 austenitic stainless steel forgings for boilers, pressure vessels, high temperature parts, and associated equipment.

1.2 Supplementary requirements are provided for use when additional testing, inspection, or processing is required. In addition, supplementary requirements from Specification A 788 may be specified when appropriate.

1.3 This specification includes the austenitic steel forgings that were a part of A 336/A 336M.

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

1.5 Unless the order specifies the applicable “M” specification designation, the material shall be furnished to the inch-pound units.

2. Referenced Documents

2.1 ASTM Standards:

A 336/A 336M Specification for Alloy Steel Forgings for Pressure and High-Temperature Parts²

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products³

A 788 Specification for Steel Forgings, General Requirements²

E 112 Test Methods for Determining the Average Grain Size⁴

2.2 Other Standards:

ASME Boiler and Pressure Vessel Code, including Section VIII Pressure Vessels and Section IX Welding Qualifications⁵

3. Ordering Information and General Requirements

3.1 In addition to the ordering information required by Specification A 788, the intended use should be stated if 5.1 is to be applicable.

3.2 Material supplied to this specification shall conform to the requirements of Specification A 788, which outlines additional ordering information, manufacturing requirements, testing and retesting methods and procedures, marking, certification, product analysis variations, and additional supplementary requirements.

3.3 If the requirements of this specification are in conflict with the requirements of Specification A 788, the requirements of this specification shall prevail.

3.4 If the forgings are intended for use under the ASME Boiler and Pressure Vessel rules at temperatures exceeding 1000°F [540°C], then use Supplementary Requirement S7. Grain size requirements for service exceeding 1000°F [540°C] should be specified unless the required grade has the suffix “H.”

4. Melting and Forging

4.1 In addition to the melting and forging requirements of Specification A 788, which may include Supplementary Requirement S8, the following condition applies:

4.1.1 A sufficient discard shall be made to secure freedom from injurious pipe and undue segregation.

NOTE 1—Because of difficulties in retaining nitrogen, vacuum melting or remelting processes should not be specified for Grades F304N, F304LN, F316N, F316LN, and FXM-11.

5. Machining

5.1 Forged pressure vessels for steam power service shall have the inner surface machined or ground. Unfired pressure vessels shall have the inner surfaces sufficiently free of scale to permit inspection.

5.2 When rough machining is performed, it may be done either before or after heat treatment.

6. Heat Treatment

6.1 Forgings shall be furnished in the solution treated condition. On completion of forging operations, the forgings shall be solution annealed and quenched in water, oil, or a polymer water solution. Direct quenching after completion of forging without subsequent reheating to the temperatures

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 A01.06 on Steel Forgings and Billets.

Current edition approved Sept. 10, 2000. Published October 2000. Originally published as A 965/A 965M-96. Last previous edition A 965/A 965M-99.

² Annual Book of ASTM Standards, Vol 01.05.

³ Annual Book of ASTM Standards, Vol 01.03.

⁴ Annual Book of ASTM Standards, Vol 03.01.

⁵ Available from American Society of Mechanical Engineers, 345 E. 47th Street, New York, NY 10017.