



Designation: A508/A508M – 17

# Standard Specification for Quenched and Tempered Vacuum-Treated Carbon and Alloy Steel Forgings for Pressure Vessels<sup>1</sup>

This standard is issued under the fixed designation A508/A508M; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope\*

1.1 This specification<sup>2</sup> covers quenched and tempered vacuum-treated carbon and alloy steel forgings for pressure vessels such as those used in reactor systems. Specifically, it covers forgings for vessel closures, shells, flanges, tube sheets, rings, heads, and similar parts.

1.2 All grades are considered weldable under proper conditions. Welding technique is of fundamental importance, and it is presupposed that welding procedure and inspection will be in accordance with approved methods for the grade of material used.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

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

NOTE 1—Grades 1 and 1A are composed of different chemistries but have the same mechanical requirements.

NOTE 2—Designations have been changed as follows:

| Current          | Formerly |
|------------------|----------|
| Grade 1          | Class 1  |
| Grade 1A         | Class 1A |
| Grade 2 Class 1  | Class 2  |
| Grade 2 Class 2  | Class 2A |
| Grade 3 Class 1  | Class 3  |
| Grade 3 Class 2  | Class 3A |
| Grade 4N Class 1 | Class 4  |
| Grade 4N Class 2 | Class 4A |

<sup>1</sup> 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 May 1, 2017. Published May 2017. Originally approved in 1964. Last previous edition approved in 2016 as A508/A508M-16. DOI: 10.1520/A0508\_A0508M-17.

<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications see related Specification SA-508/SA-508M in Section II of that Code.

|                                 |           |
|---------------------------------|-----------|
| Grade 4N Class 3                | Class 4B  |
| Grade 5 Class 1                 | Class 5   |
| Grade 5 Class 2                 | Class 5A  |
| Grade 22 Class 3                | Class 22B |
| Grade 22 Classes 4, 5, 6, and 7 |           |
| Grade 3V                        | Class 3V  |

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.6 *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:<sup>3</sup>

- A275/A275M Practice for Magnetic Particle Examination of Steel Forgings
- A370 Test Methods and Definitions for Mechanical Testing of Steel Products
- A388/A388M Practice for Ultrasonic Examination of Steel Forgings
- A788/A788M Specification for Steel Forgings, General Requirements
- A966/A966M Practice for Magnetic Particle Examination of Steel Forgings Using Alternating Current
- E208 Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels
- E428 Practice for Fabrication and Control of Metal, Other than Aluminum, Reference Blocks Used in Ultrasonic Testing

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

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