



Standard Specification for Quenched and Tempered Carbon and Alloy Steel Forgings for Pressure Vessel Components¹

This standard is issued under the fixed designation A541/A541M; 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 specification² covers requirements for quenched and tempered carbon and alloy steel forgings for pressure vessel components.

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.

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

NOTE 2—Designations have been changed as follows:

Current	Formerly
Grade 1	Class 1
Grade 1A	Class 1A
Grade 1C	Class 4
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 7
Grade 4N Class 2	Class 7A
Grade 4N Class 3	Class 7B
Grade 5 Class 1	Class 8
Grade 5 Class 2	Class 8A
Grade 11 Class 4	Class 11C
Grade 22 Class 3	Class 22B
Grade 22 Class 4	Class 22C
Grade 22 Class 5	Class 22D
Grade 22V	Class 22V
Grade 3V	Class 3V

1.3 The values stated in either inch-pound units or SI (metric) units are to be regarded separately as the standard. 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 independently of the other. Combining values from the two systems may result in nonconformance with the specification.

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 March 1, 2015. Published March 2015. Originally approved in 1965. Last previous edition approved in 2010 as A541/A541M – 05 (2010). DOI: 10.1520/A0541_A0541M-05R15.

² For ASME Boiler and Pressure Vessel Code applications see related Specification SA-541/SA-541M in Section II of that Code.

1.4 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:³

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

E208 Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels

3. Ordering Information and General Requirements

3.1 In addition to the ordering information required by Specification **A788/A788M**, the purchaser shall include with the inquiry and order a detailed drawing that locates areas of significant loading in the forging (when required); the method of selecting test locations (see 6.2); purchase option (if any) in accordance with 9.1, and any supplementary requirements desired.

3.2 Material supplied to this specification shall conform to the requirements of Specification **A788/A788M**, 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 **A788/A788M**, the requirements of this specification shall prevail.

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.