



Designation: A859/A859M – 23

Standard Specification for Age-Hardening Alloy Steel Forgings for Pressure Vessel Components¹

This standard is issued under the fixed designation A859/A859M; 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.

1. Scope*

1.1 This specification covers requirements for low-carbon age-hardening nickel-copper-chromium-molybdenum-columbium alloy steel forgings for pressure vessel components.

1.2 Forgings under this specification are available as Grades A or B. Grade A may be ordered in one or two classes as follows:

1.2.1 *Grade A Class 1*—Normalized-and-precipitation-heat-treated, providing a minimum yield strength of 55 ksi [380 MPa] and a minimum tensile strength of 65 ksi [450 MPa].

1.2.2 *Grade A Class 2*—Quenched-and-precipitation-heat-treated, providing a minimum yield strength of 65 ksi [450 MPa] and a minimum tensile strength of 75 ksi [515 MPa].

1.2.3 Grade A was the original steel composition in this specification.

1.3 Although the material is readily weldable, welding procedures are of fundamental importance and must be such as not to affect adversely the properties of the material, especially in the heat-affected zone. It is presupposed that welding procedures will be suitable for the material being welded.

1.4 Supplementary requirements, including those applicable in Specification [A788/A788M](#), are provided for use when additional testing or inspection is desired. These shall apply only when specified individually by the purchaser in the order.

1.5 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other and values from the two systems shall not be combined.

1.6 This specification is expressed in both inch-pound and SI units. However, unless the order specifies the applicable “M” specification designation [SI units], the material shall be furnished to inch-pound units.

1.7 *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:*²

[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](#)

[E604 Test Method for Dynamic Tear Testing of Metallic Materials](#)

2.2 *ASME Standard:*³

[ASME Boiler and Pressure Vessel Code—Section IX](#)

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, sketch, or written description of the forging and the method of selecting test

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 Nov. 1, 2023. Published November 2023. Originally approved in 1986. Last previous edition approved in 2019 as A859/A859M – 04 (2019)^ε. DOI:10.1520/A0859_A0859M-23.

² 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.

³ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

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