



Standard Specification for Forged Carbon and Alloy Steel Flanges for Low- Temperature Service¹

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1. Scope *

1.1 This specification covers forged carbon and alloy steel flanges intended primarily for petroleum and gas pipelines in areas subject to low ambient temperatures. Included are flanges to specified dimensions or to dimensional standards such as those MSS, ASME, and API specifications that are referenced in Section 2.

1.2 Supplementary requirements are provided for use when additional requirements are desired. These shall apply only when specified individually by the purchaser in the order.

1.3 Eight grades, four yield-strength classes, and three different notch toughness levels are included.

1.4 The availability of a particular size of flange of a specific grade and class is limited only by the capability of the composition to meet the specified mechanical property requirements. However, current practice normally limits the following:

- (a) Grade L1 to Classes 1 and 2,
- (b) Grade L2 to Classes 1, 2, and 3,
- (c) Grade L3 to Classes 1, 2, and 3,
- (d) Grade L4 to Classes 1, 2, and 3,
- (e) Grade L7 to Classes 1 and 2, and
- (f) Grades L5, L6, and L8 are generally available in any class.

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

1.6 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.

2. Referenced Documents

2.1 In addition to those reference documents listed in Specification A 961, the following list of standards apply to this specification:

2.2 *ASTM Standards:*

A 388/A 388M Practice for Ultrasonic Examination of Heavy Steel Forgings²

A 788 Specification for Steel Forgings, General Requirements²

A 961 Specification for Common Requirements for Steel Flanges, Forged Fittings, Valves, and Parts for Piping Applications³

2.3 *MSS Standards:*

SP 44 Steel Pipeline Flanges⁴

2.4 *API Standard:*

605 Large Diameter Carbon Steel Flanges⁵

2.5 *ASME Boiler and Pressure Vessel Code:*

Section IX Welding Qualifications⁶
Section VIII Division I, Part UG-84⁶

2.6 *ASME Standard:*

B 16.5 Dimensional Standards for Steel Pipe Flanges and Flanged Fittings⁶

2.7 *AWS Standards:*

A 5.1 Mild Steel Covered Electrodes⁷

A 5.5 Low-Alloy Steel Covered Arc-Welding Electrodes⁷

3. Terminology

3.1 *Definitions:*

3.1.1 *flakes*—short discontinuous internal fissures attributed to stresses produced by localized transformation and decreased solubility of hydrogen during cooling after hot working.

3.1.2 *linear surface imperfection (or indication)*—an imperfection or indication with a length at least three times its width.

² Annual Book of ASTM Standards, Vol 01.05.

³ Annual Book of ASTM Standards, Vol 01.01.

⁴ Available from Manufacturers Standardization Society of the Valve and Fittings Industry (MSS), 127 Park St., NE, Vienna, VA 22180-4602.

⁵ Available from The American Petroleum Institute (API), 1220 L. St., NW, Washington, DC 20005.

⁶ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990.

⁷ Available from The American Welding Society (AWS), 550 NW LeJeune Rd., Miami, FL 33126.

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 A01.22 on Steel Forgings and Wrought Fittings for Piping Applications and Bolting Materials for Piping and Special Purpose Applications.

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