Designation: A815/A815M – 09a

Standard Specification for Wrought Ferritic, Ferritic/Austenitic, and Martensitic Stainless Steel Piping Fittings[1]

This standard is issued under the fixed designation A815/A815M; 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 two general classes, WP and CR, of wrought ferritic, ferritic/austenitic, and martensitic stainless steel fittings of seamless and welded construction covered by the latest revision of Specification A960/A960M. Fittings differing from these standards may be furnished in accordance with Supplementary Requirement S58 of Specification A960/A960M.

1.1.1 Class WP fittings are subdivided into four subclasses: Classes WP-S, WP-W, WP-WX, and WP-WU. They are manufactured to the requirements of Specification A960/A960M, and they shall have pressure ratings compatible with 12.2. Class WP-S fittings are those manufactured from seamless product by a seamless method of manufacture (marked with class symbol WP-S); Class WP-W fittings are those which contain welds where the fitting fabrication or construction welds have been radiographed (marked with class symbol WP-W); and Class WP-WX fittings are those which contain welds where all welds have been radiographed (marked with class symbol WP-WX); and Class WP-WU fittings are those which contain welds where all welds have been ultrasonically tested (marked with class symbol WP-WU).

1.1.2 Class CR fittings are those manufactured to the requirements of MSS SP-43, and they shall have pressure ratings compatible with 12.3.

1.2 This specification does not apply to cast fittings.

1.3 Optional supplementary requirements are provided. When desired, one or more of these may be specified in the order.

1.4 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.

1.5 The values stated in either SI units or inch-pound units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. 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.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

A262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

A388/A388M Practice for Ultrasonic Examination of Steel Forgings

A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

A763 Practices for Detecting Susceptibility to Intergranular Attack in Ferritic Stainless Steels

A923 Test Methods for Detecting Detrimental Intermetallic Phase in Duplex Austenitic/Ferritic Stainless Steels

A960/A960M Specification for Common Requirements for Wrought Steel Piping Fittings

E165 Practice for Liquid Penetrant Examination for General Industry

2.2 *ASME Standards:*[3]

B16.9 Factory-Made Wrought Butt-Welding Fittings

B16.11 Forged Fittings, Socket-Welding and Threaded

2.3 *MSS Standards:*[4]

MSS SP-43 Standard Practice for Light Weight Stainless Steel Butt-Welding Fittings

MSS SP-79 Socket-Welding Reducer Inserts

MSS SP-83 Steel Pipe Unions, Socket-Welding and Threaded

MSS SP-95 Swage(d) Nipples and Bull Plugs

2.4 *ASME Boiler and Pressure Vessel Codes:*[3]

[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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[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, Three Park Ave., New York, NY 10016-5990, http://www.asme.org.

[4] Available from Manufacturers Standardization Society of the Valve and Fittings Industry (MSS), 127 Park St., NE, Vienna, VA 22180-4602, http://www.mss-hq.com.

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

Section VIII Division I, Pressure Vessels
Section IX, Welding and Brazing Qualifications
2.5 *ASNT Standard:*[5]
SNT-TC-1A Recommended Practice for Nondestructive Testing Personnel Qualification and Certification

3. Common Requirements and Ordering Information

3.1 Material furnished to this specification shall conform to the requirements of Specification A960/A960M including any supplementary requirements that are indicated in the purchase order. Failure to comply with the common requirements of Specification A960/A960M constitutes nonconformance with this specification. In case of conflict between this specification and Specification A960/A960M, this specification shall prevail.

3.2 Specification A960/A960M identifies the ordering information that should be complied with when purchasing material to this specification.

4. Materials

4.1 The material for fittings shall consist of forgings, bars, plates, or seamless or welded tubular products that conform to the chemical requirements in Table 1.

[5] Available from American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlingate Ln., Columbus, OH 43228-0518, http://www.asnt.org.

TABLE 1 Chemical Requirements

NOTE 1—Where an ellipsis (. . .) appears in this table, there is no requirement.

Composition, %														
Grade[A]														
Grade WP	Grade CR	UNS	C, max	Mn[B]	P, max	S, max	Si, max	Ni[B]	Cr	Mo	Cu[B]	N[B]	Ti	Other
Ferritic Steels														
WP27	CR27	S44627	0.010	0.75	0.020	0.020	0.40	0.50	25.0–27.5	0.75–1.50	0.20	0.015	. . .	Cb 0.05–0.20
WP33	CR33	S44626	0.06	0.75	0.040	0.020	0.75	0.50	25.0–27.0	0.75–1.50	0.20	0.040	0.20–1.00 (7×(C+N)) min	. . .
WP429	CR429	S42900	0.12	1.0	0.040	0.030	0.75	0.50	14.0–16.0	. . .	. . .	. . .	. . .	. . .
WP430	CR430	S43000	0.12	1.00	0.040	0.030	1.00	0.50	16.0–18.0	. . .	. . .	. . .	. . .	. . .
WP430TI	CR430Ti	S43036	0.10	1.00	0.040	0.030	1.00	0.75	16.0–19.5	. . .	. . .	. . .	(5×C) min 0.75 max	. . .
WP446	CR446	S44600	0.20	1.50	0.040	0.030	0.75	0.50	23.0–27.0	. . .	. . .	0.25	. . .	. . .
Ferritic/Austenitic Steels														
WPS31803	CRS31803	S31803	0.030	2.00	0.030	0.020	1.0	4.5–6.5	21.0–23.0	2.5–3.5	. . .	0.08–0.20	. . .	. . .
WPS32101	CRS32101	S32101	0.040	4.0–6.0	0.040	0.030	1.00	1.35–1.70	21.0–22.0	0.10–0.80	0.10–0.80	0.20–0.25	. . .	. . .
WPS32202	CRS32202	S32202	0.030	2.00	0.040	0.010	1.00	1.00–2.80	21.5–24.0	0.45	. . .	0.18–0.26	. . .	. . .
WPS32750	CRS32750	S32750	0.030	1.20	0.035	0.020	0.8	6.0–8.0	24.0–26.0	3.0–5.0	0.5	0.24–0.32	. . .	. . .
WPS32950	CRS32950	S32950	0.030	2.00	0.035	0.010	0.60	3.5–5.2	26.0–29.0	1.00–2.50	. . .	0.15–0.35	. . .	. . .
WPS32760	CRS32760	S32760	0.030	1.00	0.030	0.010	1.00	6.0–8.0	24.0–26.0[C]	3.0–4.0[C]	0.50–1.00	0.20–0.30[C]	. . .	W 0.50–1.00
WPS39274	CRS39724	S32974	0.030	1.00	0.030	0.020	0.80	6.0–8.0	24.0–26.0	2.50–3.50[C]	0.20–0.80	0.24–0.32	. . .	W 1.50–2.50
WPS32550	CRS32550	S32550	0.04	1.50	0.040	0.030	1.00	4.5–6.5	24.0–27.0	2.9–3.9	1.50–2.50	0.10–0.25	. . .	. . .
WPS32205	CRS32205	S32205	0.030	2.00	0.030	0.020	1.00	4.5–6.5	22.0–23.0	3.0–3.5	. . .	0.14–0.20	. . .	. . .
Martensitic Steels														
WP410	CR410	S41000	0.15	1.00	0.040	0.030	1.00	0.50 max	11.5–13.5	. . .	. . .	. . .	. . .	. . .
WPS41008	CRS41008	S41008	0.08	1.00	0.040	0.030	1.00	0.60	11.5–13.5	. . .	. . .	. . .	. . .	. . .
WPS41500	CRS41500	S41500	0.05	0.50–1.00	0.030	0.030	0.60	3.5–5.5	11.5–14.0	0.50–1.00	. . .	. . .	. . .	W 0.50–1.00

[A] Naming system developed and applied by ASTM International.
[B] Maximum unless otherwise indicated.
[C] % Cr + 3.3 × % Mo + 16 × % N = 40 min.