Designation: A 414/A 414M – 00

Standard Specification for Steel, Sheet, Carbon, for Pressure Vessels[1]

This standard is issued under the fixed designation A 414/A 414M; 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[2] covers hot-rolled carbon steel sheet for pressure vessels involving fusion welding or brazing. Welding and brazing technique is of fundamental importance and shall be in accordance with commercial practices.

1.2 The following grades are included in this specification:

Mechanical Requirements

Grade	Yield Strength, min		Tensile Strength, min	
	ksi	MPa	ksi	MPa
A	25	170	45	310
B	30	205	50	345
C	33	230	55	380
D	35	240	60	415
E	38	260	65	450
F	42	290	70	485
G	45	310	75	515

1.3 Hot-rolled carbon steel sheet is generally furnished in cut lengths and to decimal thickness only. Coils may be furnished provided tension test specimens are taken to represent the middle of the slab as required by 5.1.4. The purchaser should recognize this requires cutting the coils to obtain test samples and results in half-size coils. The sheet is furnished to the following size limits:

Thickness, in [mm]	Width, in. [mm]	
	Over 12 to 48 [Over 300 to 1200]	Over 48 [Over 1200]
0.270 to 0.230 [7.0 to 6.0][A]	sheet (coils only)	sheet (coils only)
0.230 to 0.180 [6.0 to 4.5]	sheet	sheet (coils only)
Under 0.180 to 0.057 [under 4.5 to 1.5]	sheet	sheet

[A] For thicknesses greater than 0.230 in. [6.0 mm], the thickness tolerances of Specification A 635/A 635M apply.

1.4 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 shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

2. Referenced Documents

2.1 *ASTM Standards:*

A 568/A 568M Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for[3]

A 635/A 635M Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Carbon, Hot Rolled[3]

3. Ordering Information

3.1 Orders for material under this specification shall include the following information, as required, to describe the material adequately:

3.1.1 Designation or specification number, date of issue, and grade,

3.1.2 Copper bearing steel, when required,

3.1.3 Special requirements, if required,

3.1.4 Condition—pickled (or blast cleaned), if required. (Material so ordered will be oiled unless ordered dry.), and

3.1.5 Dimensions, including type of edges.

3.1.5.1 As agreed upon between the purchaser and the producer, material ordered to this specification will be supplied to meet the appropriate standard or restricted thickness tolerance table shown in Specification A 568/A 568M.

NOTE 1—Not all producers are capable of meeting all of the limitations of the thickness tolerance tables in Specification A 568/A 568M. The purchaser should contact the producer regarding possible limitations prior to placing an order.

3.1.6 Cast or heat analysis, or test report request, or both, if required.

NOTE 2—A typical ordering description is as follows: "ASTM A 414, Grade A, Hot-Rolled Sheet, 0.100 in. [2.54 mm] by 36 in. [914.4 mm] by 96 in. [2438 mm], cut edges."

4. Chemical Requirements

4.1 *Cast or Heat Analysis*—The analysis of the steel shall conform to the requirements prescribed in Table 1.

4.1.1 Unspecified elements may be present. Limits on elements shall be as stated in Table 2.

4.1.1.1 Each of the elements listed in Table 2 shall be included in the report of the heat analysis. When the amount of an element present is less than 0.02 %, the analysis may be reported as "<0.02 %."

4.2 *Product, Check, or Verification Analysis*—Analyses

[1] This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.19 on Sheet Steel and Strip.

Current edition approved March 10, 2000. Published May 2000. Originally published as A 414 – 71. Last previous edition A 414/A 414M – 98.

[2] For ASME Boiler and Pressure Vessel Code applications see related Specification SA-414 in Section 11 of that Code.

[3] *Annual Book of ASTM Standards*, Vol 01.03.