Designation: A 570/A 570M – 98

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Structural Steel, Sheet and Strip, Carbon, Hot-Rolled[1]

This standard is issued under the fixed designation A 570/A 570M; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers hot-rolled carbon structural steel sheet and strip in cut lengths or coils. This material is intended for structural purposes where mechanical test values are required, and is available in a maximum thickness of 0.229 in. [6.0 mm] except as limited by Specifications A 568/A 568M and A 749/A 749M. The maximum thickness may be further limited by the capacity of the composition to meet the specified mechanical property requirements.

1.1.1 The following grades are covered in this specification:

	Mechanical Properties	
Grade	Yield Point, min, ksi [MPa]	Tensile Strength, ksi [MPa]
30	30 [205]	49 [340] min
33	33 [230]	52 [360] min
36 Type 1	36 [250]	53 [365] min
36 Type 2	36 [250]	58–80 [400–550]
40	40 [275]	55 [380] min
45	45 [310]	60 [415] min
50	50 [345]	65 [450] min
55	55 [380]	70 [480] min

1.2 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[2]

A 749/A 749M Specification for Steel, Strip, Carbon and High-Strength, Low-Alloy, Hot-Rolled, General Requirements for[2]

3. Ordering Information

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

3.1.1 ASTM specification number and date of issue, and grade,

3.1.2 Copper-bearing steel (if required),

3.1.3 Special requirements (if required),

3.1.4 Name of material (hot-rolled sheets or strip),

3.1.5 Condition—Material to this specification is furnished in the hot-rolled condition. Pickled (or blast cleaned) should be specified if required. Material so ordered will be oiled unless ordered dry, and

3.1.6 Dimensions, including type of edges.

3.1.6.1 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.

3.1.7 Coil size requirements.

NOTE 2—A typical ordering description is as follows: ASTM A 570—19XX, Grade 36, Hot-Rolled Sheets, 0.075 by 36 cut edge by 96 in. or ASTM A 570M—19XX, Grade 36, Hot-Rolled Sheets, 1.85 by 900 cut edge by 2450 mm).

4. Chemical Composition

4.1 The cast or heat 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 copper, nickel, chromium, or molybdenum is less than 0.02 %, the analysis may be reported as <0.02 %. When the amount of vanadium or columbium is lesss than 0.008 %, the analysis may be reported as <0.008 %.

5. Mechanical Property Requirements

5.1 *Tensile Tests*:

5.1.1 *Requirements*—Material as represented by the test specimen shall conform to the tensile requirements specified in Table 3.

5.1.2 *Number of Tests*—Two tensile tests shall be made

[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 Steel Sheet and Strip.

Current edition approved June 10, 1998. Published November 1998. Originally published as A 570 – 66 T. Last previous edition A 570 – 97.

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

TABLE 1 Chemical Requirements

Element	Composition, Weight, %	
	Grades 30, 33, 36 Type 1, and 40	Grades 36 Type 2, 45, 50, and 55
Carbon, max	0.25	0.25
Manganese, max	0.90	1.35
Phosphorus, max	0.035	0.035
Sulfur, max	0.04	0.04
Aluminum[A]	. . .	. . .
Silicon[A]	. . .	. . .[B]
Copper, when copper is specified, min	0.20	0.20

[A] Where an ellipsis (...) appears in this table, there is no requirement, but the analysis shall be reported.

[B] For Grade 36 Type 2, the silicon is 0.40 Wt. % maximum.

TABLE 2 Limits on Additional Elements (see 5.1.1)

Copper, max %[A]	Heat analysis	0.20
	Product analysis	0.23
Nickel, max %[A]	Heat analysis	0.20
	Product analysis	0.23
Chromium, max %[A,B]	Heat analysis	0.15
	Product analysis	0.19
Molybdenum, max %[A,B]	Heat analysis	0.06
	Product analysis	0.07
Vanadium, max %	Heat analysis	0.008
	Product analysis	0.018
Columbium, max %	Heat analysis	0.008
	Product analysis	0.018

[A] The sum of copper, nickel, chromium, and molybdenum shall not exceed 0.50 % on heat analysis. When one or more of these elements are specified, the sum does not apply; in which case, only the individual limits on the remaining unspecified elements will apply.

[B] The sum of chromium and molybdenum shall not exceed 0.16 % on heat analysis. When one or more of these elements are specified, the sum does not apply; in which case, only the individual limits on the remaining unspecified elements will apply.

from each heat or from each lot of 50 tons (45 Mg). When the amount of finished material from a heat or lot is less than 50 tons (45 Mg), one test shall be made. When material rolled from one heat differs 0.050 in. (1.27 mm) or more in thickness, one tensile test shall be made from the thickest and thinnest material regardless of the weight represented.

5.1.3 *Location and Orientation*:

5.1.3.1 Tensile test specimens shall be taken at a point immediately adjacent to the material to be qualified.

5.1.3.2 Tensile test samples shall be taken from the full thickness of the sheet as rolled.

5.1.3.3 Tensile test specimens shall be taken from a location approximately halfway between the center of the sheet and the edge of the material as-rolled.

5.1.3.4 Tensile test specimens shall be taken with the axis of the test specimen parallel to the rolling direction (longitudinal test).

5.1.4 *Test Method*—Yield strength shall be determined by either the 0.2 % offset method or by the 0.5 % extension under load method unless otherwise specified.

5.2 *Bending Properties*—The minimum forming radius (radii) which steel covered by this specification can be expected to sustain is listed in the appendix and is discussed in more detail in Specifications A 568/A 568M and A 749/A 749M. When tighter bend radii are required, or curved or offset bends are involved, or when stretching or drawing are also a consideration, the producers shall be consulted.

6. General Requirements for Delivery

6.1 Material furnished under this specification shall conform to the applicable requirements of the current edition of Specification A 568/A 568M and A 749/A 749M unless otherwise provided herein.

7. Certification and Reports

7.1 The manufacturer shall furnish copies of a test report showing the results of the heat analysis and the mechanical property tests made to determine compliance to the specification. The report shall include the purchase order number, ASTM designation number, and the heat or lot number correlating the test results with the material represented.

8. Keywords

8.1 carbon steel sheet; carbon steel strip; hot rolled steel sheet; hot rolled steel strip; steel sheet; steel strip