



Designation: A 366/A 366M – 97^{ε1}

Standard Specification for Commercial Steel (CS) Sheet, Carbon, (0.15 Maximum Percent) Cold-Rolled¹

This standard is issued under the fixed designation A 366/A 366M; 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.

^{ε1} NOTE—Table 1 (Nickel — Type B) was corrected editorially in October 1998.

1. Scope

1.1 This specification covers cold-rolled carbon commercial steel (CS) sheet, in coils or cut lengths. This material is intended for exposed or unexposed parts where bending, moderate drawing, forming, and welding may be involved.

1.2 This specification is not applicable to Specification A 109/A 109. Narrow widths multiple slit from wide sheet are not strip, unless they qualify as strip because of thickness, special finish, special edge, or special temper.

1.3 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 ASTM Standards:

A 109 Specification for Steel, Strip, Carbon, Cold-Rolled²
A 370 Test Methods and Definitions for Mechanical Testing of Steel Products²

A 568/A 568M Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for²

A 619/A 619M Specification for Non-Killed, Forming Steel (NKFS) Sheet, Carbon, Cold-Rolled²

A 620/A 620M Specification for Drawing Steel (DS), Sheet, Carbon, Cold-Rolled²

3. Classification

3.1 Cold-rolled sheet is supplied for either exposed or unexposed applications. Within the latter category, cold-rolled sheet is specified either “temper rolled” or “annealed last.” For

details on processing, attributes and limitations, and inspection standards, refer to Specification A 568/A 568M. A 568/A 568M

4. Ordering Information

4.1 It is the purchaser’s responsibility to specify in the purchase order all ordering information necessary to purchase the needed material. Examples of such information include, but are not limited to, the following:

4.1.1 ASTM specification number and year of issue,

4.1.2 Name of material (cold-rolled commercial steel (CS) sheet),

4.1.3 Type - When a type is not specified, Type B will be furnished,

4.1.4 Copper-bearing steel (if required),

4.1.5 Finish (indicate unexposed, or exposed, matte finish, commercial bright, or luster as required),

4.1.6 Specify oiled or not oiled, as required,

4.1.7 Dimensions (thickness, width, and whether cut lengths or coils),

4.1.7.1 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. 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. A 568/A 568M. The purchaser should contact the producer regarding possible limitations prior to placing an order.

4.1.8 Coil size (must include inside diameter, outside diameter, and maximum mass),

4.1.9 Application (part identification and description),

4.1.10 Special requirements (if required), and

4.1.11 Cast or heat analysis report (request, if required).

NOTE 2—A typical ordering description is as follows:
ASTM A 366-XX[or A 366M-XX], Cold-Rolled Commercial Steel (CS) Sheet, Type A, Exposed, Matte Finish, Oiled, 0.035 by 30 by 96 in. [or .88 by 760 by 2440 mm] Standard Thickness Tolerance, for Part No. 4560, Door Panel.

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.

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² Annual Book of ASTM Standards, Vol 01.03.

5. General Requirements for Delivery

5.1 Material furnished under this specification shall conform to the applicable requirements of the current addition of Specification A 568/A 568M **A 568/A 568M**, unless otherwise provided herein.

6. Chemical Composition

6.1 The cast or heat analysis of the steel shall conform to the chemical composition in **Table 1**.

6.1.1 Each of the elements listed in **Table 1** 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 less than 0.008 %, the analysis may be reported as <0.008 %.

6.2 When a type is not specified, Type B will be furnished.

TABLE 1 Chemical Requirements

Composition—Weight % Heat Analysis			
Element	Type A ^{A,B}	Type B ^{C,D}	Type C ^{A,B}
Carbon	0.10 max	0.02/0.15	0.08 max
Manganese, max	0.60	0.60	0.60
Phosphorus, max	0.030	0.030	0.100
Sulfur, max	0.035	0.035	0.035
Aluminum ^{E,F}	...	...	...
Silicon ^F	...	...	...
Copper			
When copper steel is specified, min ^G	0.20	0.20	0.20
When copper steel is not specified, max ^G	0.20	0.20	0.20
Nickel, max ^G	0.20	0.20	0.20
Chromium max ^{G,H}	0.15	0.15	0.15
Molybdenum, max ^G	0.06	0.06	0.06
Vanadium, max	0.008	0.008	0.008
Columbium, max ^B	0.008	0.008	0.008
Titanium, max ^B	0.008	0.008	0.008

^A Types A and C may be furnished as vacuum degassed and/or chemically stabilized at the producer's option.

^B For carbon levels less than or equal to 0.02%, columbium and/or titanium may be used as chemical stabilizing elements in Types A and C at the producer's option. In such case, the Table 1 limitations on such elements do not apply. Rather, the limit on columbium shall be 0.10% maximum and the limit on titanium shall be 0.15 % maximum.

^C Type B describes the most common product previously included in Specification A 366/A 366M.

^D Specify Type B to avoid carbon levels below 0.02 %.

^E When an aluminum deoxidized steel is required for the application, Commercial Steel (CS) may be ordered to a minimum of 0.01 % total aluminum.

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

^G When copper steel is not specified, the sum of copper, nickel, chromium, and molybdenum shall not exceed 0.50 % on heat analysis. When one or more of these elements is specified, the sum does not apply; in which case, only the individual limits on the remaining elements will apply.

^H Chromium is permitted, at the producer's option, to 0.25 % maximum when the carbon is less than or equal to 0.05 %. In such case, the limit on the sum of the four elements in Footnote G does not apply.

7. Mechanical Properties

7.1 Typical, nonmandatory mechanical properties are found in **Table 2**.

7.2 *Bend Test*—The material shall be capable of being bent, at room temperature, in any direction through 180° flat on itself without cracking on the outside of the bent portion (see Section 14 of Test Methods and Definitions A 370).

7.3 *Hardness*—If no special flattening is required, sheet of this quality is not expected to exceed a hardness equivalent of Rockwell B60 at time of shipment.

7.4 Moderate deformations on identified parts are assessed by the use of the scribed square test as described by Specification A 568/A 568M. **A 568/A 568M** Experience has shown that if the percent increase in area of any drawn portion of a satisfactory untrimmed part is 25 % or less, commercial steel should give satisfactory performance. If it is more than 25 %, non-killed forming steel or drawing steel should be specified. (See Specifications A 619/A 619M **A 619/A 619M** and A 620/A 620M) **A 620/A 620M**

7.5 If freedom from stretcher strains or fluting during fabrication is required, exposed finish should be specified and material should be effectively roller leveled immediately before use. Material so specified is subject to aging with elapsed time. (See Appendix X2 of Specification A 568/A 568M **A 568/A 568M**.)

8. Certification

8.1 When requested, the producer shall furnish copies of a report showing test results of the cast or heat analysis. The report shall include the purchase order number, ASTM designation number, and the cast or heat number representing the material.

9. Keywords

9.1 carbon steel sheet; cold rolled steel sheet; commercial quality steel; steel sheet

TABLE 2 Typical Mechanical Properties^{A,B}

Yield Strength ksi [MPa] ^C	20/40 [140/275]
Elongation in 2 in. [50 mm] % ^C	≥ 30

^A The typical mechanical property values presented here are nonmandatory. They are intended solely to provide the purchaser with as much information as possible to make an informed decision on the steel to be specified. Values outside of these ranges are to be expected.

^B These typical mechanical properties apply to the full range of steel sheet thicknesses. However, there is a tendency for yield strength to increase and elongation to decrease as sheet thickness decreases.

^C Yield strength and elongation are measured in the longitudinal direction in accordance with Test Methods and Definitions A 370.