



Designation: A 619/A 619M - 97

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Non-Killed Forming Steel (NKFS) Sheet, Carbon, Cold-Rolled¹

This standard is issued under the fixed designation A 619/A 619M; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

This specification has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This specification covers cold-rolled carbon non-killed forming steel (NKFS) sheet in coils or cut lengths. The material is intended for fabricating identified parts where drawing or severe forming may be involved.

1.2 This specification is applicable for orders in either inch-pound units (as A 619) or SI units (A 619M).

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 for²
- A 620/A 620M Specification for Drawing Steel (DS), Sheet, Carbon, Cold-Rolled²

3. Terminology

3.1 Definitions:

3.1.1 *aging*—loss of ductility with an increase in hardness, yield point, and tensile strength that occur when steel, which has been slightly cold worked (such as by temper rolling), is stored for some time. Aging also increases the tendency toward stretcher strains and fluting.

3.1.2 *non-killed forming steel (NKFS)*—sheet manufactured from specially produced or selected steels specially processed to have good uniform drawing properties for use in fabricating an identified part having severe deformations.

4. Classification

4.1 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 Specifications A 568/A 568M.

5. Ordering Information

5.1 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:

- 5.1.1 ASTM specification number and year of issue,

- 5.1.2 Name of material (cold-rolled non-killed forming steel (NKFS) sheet),

- 5.1.3 Classification (either exposed, unexposed, temper rolled, or annealed last) (see 4.1),

- 5.1.4 Finish (matte finish will be supplied on exposed, unless otherwise specified, and on unexposed) (see 10.1),

- 5.1.5 Oiling (material will be oiled unless ordered not oiled) (see 10.2),

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

- 5.1.6.1 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.

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

- 5.1.8 Quantity,

- 5.1.9 Application (show part identification and description),

- 5.1.10 Special requirements (if required), and

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

NOTE 2—A typical ordering description is as follows:
“ASTM A619-XX [or A619M-XX], Cold-Rolled Non-Killed Forming Steel (NKFS) Sheet, exposed, oiled, 0.035 nominal by 53 in.

TABLE 1 Chemical Requirements

Element	Composition—Weight % Heat Analysis
Carbon	0.02/0.10
Manganese, max	0.50
Phosphorus, max	0.020
Sulfur, max	0.030
Aluminum ^A	...
Silicon ^A	...
Copper, max ^B	0.20
Nickel, max ^B	0.20
Chromium, max ^{B,C}	0.15
Molybdenum, max ^B	0.06
Vanadium, max	0.008
Columbium, max	0.008
Titanium, max	0.008

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

^B 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.

^C 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 B does not apply.

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.