



Designation: A 921/A 921M – 93 (Reapproved 1999)

Standard Specification for Steel Bars, Microalloy, Hot-Wrought, Special Quality, for Subsequent Hot Forging¹

This standard is issued under the fixed designation A 921/A 921M; 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 hot-wrought, special quality microalloyed carbon steel bars intended for use as hot forging stock. The bars shall be hot-wrought, as-wrought, unless thermal treatment is necessary to ensure cold shearability.

1.2 The bars shall be furnished to chemical composition only. Chemical composition is based on standard carbon steel grades modified to include microalloying elements such as columbium (niobium), vanadium, or molybdenum. Desired mechanical properties are developed in the subsequent hot forging and controlled cooling operations.

1.3 Sections and sizes of bar steel available are covered in Specification A 29/A 29M.

1.4 Supplementary requirements S1 to S6 are provided for use when additional controls or requirements are desired. These shall apply only when specified on the purchase order.

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

1.6 Unless the order specifies the applicable “M” specification designation, the material shall be furnished to the inch-pound units.

2. Referenced Documents

2.1 ASTM Standards:

A 29/A 29M Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for²

A 576 Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality²

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products³

A 788 Specification for Steel Forgings, General Requirements²

E 45 Practice for Determining the Inclusion Content of Steel⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *microalloyed steels*—microalloyed steels are carbon steels to which small quantities of certain elements are added in order to enhance mechanical properties. This enhancement of mechanical properties results from control of the temperature and cooling rate during the final hot-working process.

4. Ordering Information

4.1 Orders for material supplied to this specification should include the following, as required, to describe adequately the desired material:

4.1.1 Quantity (weight or number of bars),

4.1.2 Name of material (hot-rolled microalloyed steel bars),

4.1.3 Dimensions,

4.1.4 ASTM specification number and date of issue,

4.1.5 Grade designation or chemical composition limits (see 8.1 to 8.5),

4.1.6 Type (see 7.1) to designate grain refiner,

4.1.7 Additions to the specification and Supplementary Requirements, if required, and,

4.1.8 End use.

5. General Requirements

5.1 Material furnished under this specification shall conform to the applicable requirements of the current edition of Specification A 29/A 29M, unless otherwise provided herein.

6. Materials and Manufacture

6.1 *Melting Practice*—The steel shall be produced in accordance with the applicable methods for primary and secondary melting outlined in Specification A 788.

6.2 The steel shall be killed. Supplementary Requirements S1 through S6 may be invoked upon agreement between producer and purchaser.

6.3 The bars shall be special quality.

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 A01.15 on Bars.

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² *Annual Book of ASTM Standards*, Vol 01.05.

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

⁴ *Annual Book of ASTM Standards*, Vol 03.01.