



Standard Specification for Tool Steel High Speed¹

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

1. Scope

1.1 This specification covers tungsten-type and molybdenum-type high-speed steels available as annealed, hot-rolled bars, forgings, plate, sheet, or strip, and annealed, cold-finished bars or forgings used primarily in the fabrication of tools.

1.2 Seven types of tungsten high-speed tool steels designated T1, T2, etc., seventeen types of molybdenum high-speed tool steels designated M1, M2, etc., and two intermediate high speed steels designated as M50 and M52 are covered. Selection will depend upon design, service conditions, and mechanical properties.

1.3 The term “high-speed steel” is described and its minimum requirements are covered in the Annex.

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are provided for information only.

2. Referenced Documents

2.1 ASTM Standards:

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products²

A 388/A 388M Practice for Ultrasonic Examination of Heavy Steel Forgings³

A 561 Practice for Macroetch Testing of Tool Steel Bars³

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment³

E 3 Methods of Preparation of Metallographic Specimens⁴

E 30 Test Methods for Chemical Analysis of Steel, Cast Iron, Open-Hearth Iron, and Wrought Iron⁵

E 45 Practice for Determining the Inclusion Content of Steel⁴

E 59 Practice for Sampling Steel and Iron for Determination of Chemical Composition⁵

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 A01.29 on Tool Steel.

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² Annual Book of ASTM Standards, Vol 01.03.

³ Annual Book of ASTM Standards, Vol 01.05.

⁴ Annual Book of ASTM Standards, Vol 03.01.

⁵ Annual Book of ASTM Standards, Vol 03.05.

2.2 Military Standard:

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage⁶

2.3 Federal Standards:

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)⁶

Fed. Std. No. 183 Continuous Identification Marking of Iron and Steel Products⁶

3. Classification

3.1 Material in accordance with this specification is classified by chemical composition. Types correspond to respective AISI designations.

3.1.1 Types T1, T2, T4, T5, T6, T8, and T15 are characterized by a controlled high tungsten content along with other alloying elements.

3.1.2 Types M1, M2, M3, M4, M6, M7, M10, M30, M33, M34, M36, M41, M42, M43, M44, M46, M47, M48, and M62 are characterized by a controlled high molybdenum content along with other alloying elements.

3.1.3 Types M2, M3, and M10 are further classified according to carbon range. Type M3 is further classified according to vanadium range.

3.1.4 Types M50 and M52 are considered intermediate high speed steels in view of their lower total alloy content than the standard types. These leaner alloy grades normally are limited to less severe service conditions.

4. Ordering Information

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

4.1.1 Name of material (high-speed tool steel),

4.1.2 Type,

4.1.3 Shape (sheet, strip, plate, flat bar, round bar, square bar, hexagon bar, octagon, special shapes),

4.1.4 Dimensions (thickness, width, diameter, length). (For coils, include the minimum inside diameter or inside diameter range, the maximum outside diameter, and maximum or minimum coil weight if required. (Minimum coil weights are subject to negotiation.)),

⁶ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.