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Standard Specification for MACHINED FLAT AND SQUARE TOOL STEEL BARS[1]

This standard is issued under the fixed designation A 685; 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 specification has been approved for use by agencies of the Department of Defense and for listing in the DoD Index of Specifications and Standards.

1. Scope

1.1 This specification covers ten types of tool steel, establishes bar sizes, and the dimensional and surface requirements for flat and square alloy tool steel bars machined on all four sides, or cut from machined plate.

1.2 Utilization of the specified standard products, which are free of decarburization and other surface imperfections, will benefit consumer and supplier by permitting improved service, reduced inventories, superior quality, and economy.

NOTE—The values stated in inch-pound units are to be regarded as the standard.

2. Applicable Document

2.1 *ASTM Standard:*

A 681 Specification for Alloy Tool Steels[2]

3. Ordering Information

3.1 Purchase orders shall include the following information to describe the desired material:

3.1.1 ASTM specification number and date of issue.

3.1.2 Name of material (machined tool steel bar),

3.1.3 Type of material (O6, D2, S7, etc.),

3.1.4 Shape (flat, square),

3.1.5 Dimensions (thickness, width, length),

3.1.6 Condition (annealed), and

3.1.7 Special requirements.

4. Material

4.1 Ten standard types of tool steel are represented. They include: cold-work air-hardening Types A2, A4, and A6; cold-work oil-hardening Types O1, O2, and O6; cold-work high carbon high chromium Types D2 and D3; hot-work Type H13; and shock resisting air-hardening Type S7.

4.2 Each type of tool steel shall conform to the applicable chemical, mechanical, and metallurgical requirements of the latest issue of Specification A 681.

5. Bar Sizes

5.1 The width and thickness dimensions for standard flat and square machined tool steel bars are tabulated in Table 1. The bars are furnished oversize to allow for finishing after heat treating. For larger sizes, refer to the producer.

6. Permissible Dimensional Variations

6.1 All flat and square machined tool steel bars shall conform to the size, straightness, squareness, and surface finish requirements of Table 2.

7. Packaging and Marking

7.1 Each bar shall be packaged to protect it from damage in shipping and in handling. It shall also be surface treated with a corrosion preventative that can be removed readily without damage to the bar.

7.2 Each lot of material shall be marked with the purchase order number, type of tool steel, size, weight, and ASTM specification number A 685 to assure proper identification.

8. Inspection, Rejection, and Rehearing

8.1 The procedures and requirements of the latest issue of Specification A 681 shall apply.

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[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 Steels.

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

TABLE 1 Standard Sizes of Machined Flat and Square Tool Steel Bars*

Width, in. (mm)	Thickness, in. (mm)																		
	½ (13)	⅝ (16)	¾ (19)	⅞ (22)	1 (25)	1⅛ (29)	1¼ (32)	1⅜ (35)	1½ (38)	1¾ (44)	2 (51)	2¼ (57)	2½ (64)	3 (76)	3½ (89)	4 (102)	4½ (108)	5 (127)	6 (152)
½ (13)	*																		
⅝ (16)		*																	
¾ (19)	*	*	*																
⅞ (22)	*	*	*	*															
1 (25)	*	*	*	*	*														
1⅛ (29)	*	*	*	*		*													
1¼ (32)	*	*	*	*	*	*	*												
1⅜ (35)	*	*	*					*											
1½ (38)	*	*	*	*	*	*	*	*	*										
1¾ (44)	*	*	*	*	*	*	*	*	*	*									
1⅞ (48)	*	*	*																
2 (51)	*	*	*	*	*	*	*	*	*	*	*								
2¼ (57)	*	*	*	*	*	*	*	*	*	*	*	*							
2½ (64)	*	*	*	*	*	*	*	*	*	*	*	*	*						
2¾ (70)	*	*	*	*	*	*	*	*	*	*	*		*						
3 (76)	*	*	*	*	*	*	*	*	*	*	*	*	*	*					
3¼ (83)	*	*	*																
3½ (89)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
3¾ (95)	*	*	*																
4 (102)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*			
4½ (108)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
5 (127)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	
5½ (140)				*	*		*				*								
6 (152)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*
7 (178)				*	*		*		*	*	*		*						
8 (203)	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*		*	*
9 (229)									*										
10 (254)				*	*	*	*	*	*	*	*		*	*	*	*		*	*
12 (305)				*	*	*	*	*	*	*	*		*	*	*	*		*	*