

ASME B18.25.2M-1996

WOODRUFF KEYS AND KEYWAYS

AN AMERICAN NATIONAL STANDARD

GOVERNMENT KEY WORDS
KEY, WOODRUFF



The American Society of
Mechanical Engineers



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Mechanical Engineers

A N A M E R I C A N N A T I O N A L S T A N D A R D

WOODRUFF KEYS AND KEYWAYS

ASME B18.25.2M-1996

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FOREWORD

(This Foreword is not part of ASME B18.25.2M-1996)

In 1994 ASME Subcommittee B18.25 was created. This subcommittee then assumed the responsibilities of ANSI Standards Committee B17.

The first endeavor of this subcommittee was to create U.S. standards for metric Woodruff and square and rectangular keys. This Standard, covering square and rectangular keys, is based on the ISO standard with modifications to reflect U.S. manufacturing and user needs. The final document was balloted June 29, 1995.

Following approval by ASME, the document was submitted to the American National Standards Institute. This Standard was approved by ANSI on February 5, 1996.

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Standardization of Bolts, Nuts, Rivets, Screws, Washers, and Similar Fasteners

(The following is the roster of the Committee at the time of approval of this Standard.)

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CONTENTS

Foreword	iii
Standards Committee Roster	v
1 Introductory Notes	1
1.1 Scope	1
1.2 Comparison With ISO 3912-1977	1
1.3 Dimensions	1
1.4 Tolerances	1
1.5 Terminology	1
1.6 Referenced Standards	1
1.7 Designation	1
2 Requirements	2
2.1 Material	2
2.2 Dimensions and Tolerances	2
Tables	
1 Dimensions for Woodruff Keys	3
2 Dimensions for Woodruff Keyways	4

WOODRUFF KEYS AND KEYWAYS

1 INTRODUCTORY NOTES

1.1 Scope

1.1.1 This Standard covers requirements for metric Woodruff keys and keyways intended for both alignment of shafts and hubs, and transmitting torque between shafts and hubs.

1.1.2 The inclusion of dimensional data in this Standard is not intended to imply that all sizes described are production stock items. Consumers should consult with suppliers concerning lists of stock items.

1.2 Comparison With ISO 3912-1977

This Standard is based on ISO 3912-1977, Woodruff Keys and Keyways. However, to improve manufacturability, tolerances are decreased for the keyway width. The resulting fit is approximately the same. Keys manufactured to this Standard are functionally interchangeable with keys manufactured to the ISO standard. Because of tighter width tolerances in this Standard, products manufactured to the ISO standard may not meet the requirements of this Standard.

This Standard also differs from ISO 3912 in that it:

- (a) does not restrict the corners of a key to be chamfered but allows either a chamfer or a radius on the key;
- (b) specifies a key material hardness rather than a tensile property;
- (c) specifies h12 rather than h11 for the tolerance of the height of the keys.

1.3 Dimensions

Unless otherwise specified, all dimensions in this standard are in millimeters (mm).

1.4 Tolerances

Many of the tolerances shown in Tables 1 and 2 are from ANSI B4.2, Preferred Metric Limits and Fits (ISO 286-1 and ISO 286-2).

As a result in addition to plus-minus tolerances which are common in the U.S. some are expressed as plus-plus deviations from the basic size. For further interpretation of these tolerances refer to ANSI B4.2 or ISO 286.

1.5 Terminology

For definitions of terms relating to fasteners or component features used in this Standard, refer to ANSI B18.12, Glossary of Terms for Mechanical Fasteners.

1.6 Referenced Standards

Referenced ASME standards may be obtained from the American Society of Mechanical Engineers, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300.

Referenced ISO standards may be obtained from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002.

1.7 Designation

Keys conforming to this Standard shall be designated by the following data, preferably in the sequence shown:

- (a) ASME document number;
- (b) product name;
- (c) nominal size [width (*b*), height (*h*₁), diameter (*D*)];
- (d) form;
- (e) hardness (if other than non-hardened).

EXAMPLES:

- (1) ASME B18.25.2M, Woodruff Key 6 x 10 x 25 normal hardened;
- (2) ASME B18.25.2M, Woodruff Key 3 x 5 x 13 Whitney.

2 REQUIREMENTS

2.1 Material

Standard steel keys shall have a hardness of 183 HV min. Hardened keys shall be alloy steel through hardened to a Vickers hardness of 390 to 510 HV. When other materials and properties are required, these shall be as agreed upon by the supplier and customer.

2.2 Dimensions and Tolerances

Dimensions and tolerances for Woodruff keys are shown in Table 1. Recommended dimensions and tolerances for keyways are shown in Table 2.

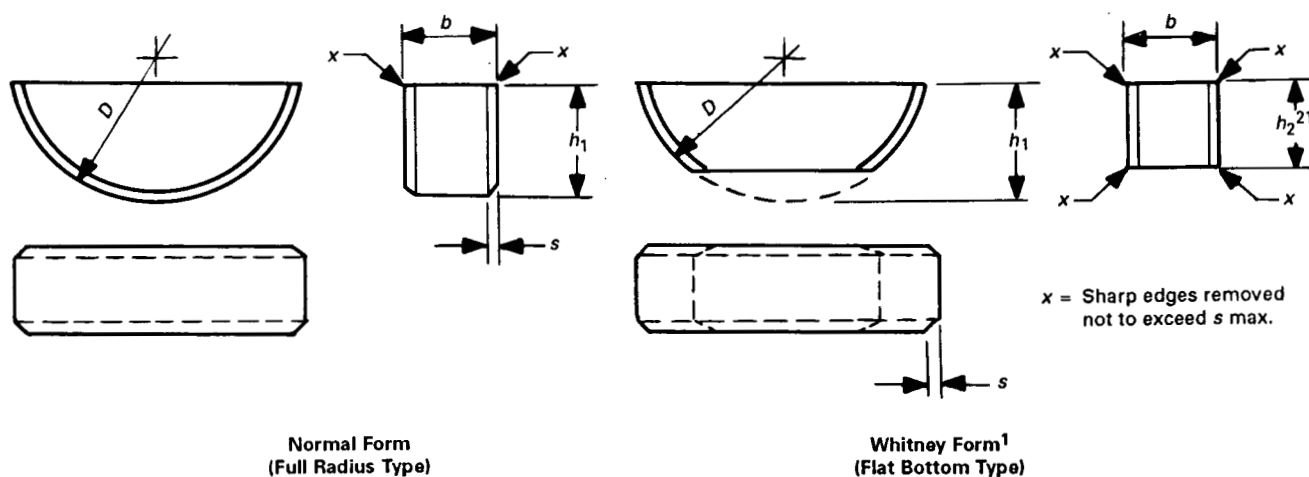


TABLE 1 DIMENSIONS FOR WOODRUFF KEYS

Key Size $b \times h_1 \times D$	Width		Height				Diameter, D		Chamfer or Radius, s	
	b	Tolerance	h_1	Tolerance h_{12}	h_2 [Notes (1), (2)]	Tolerance h_{12}	D	Tolerance h_{12}	Min.	Max.
1×1.4×4	1	0 −0.025	1.4	0 −0.10	1.1	0 −0.10	4	0 −0.120	0.16	0.25
1.5×2.6×7	1.5		2.6	2.1	7		0 −0.150			
2×2.6×7	2		2.6	2.1	7					
2×3.7×10	2		3.7	3.0	10					
2.5×3.7×10	2.5		3.7	−0.12	3.0	10	0 −0.12	0 −0.210	0.25	0.40
3×5×13	3		5.0	4.0	13					
3×6.5×16	3		6.5	5.2	16	0 −0.180				
4×6.5×16	4		6.5	5.2	16					
4×7.5×19	4		7.5	6.0	0 −0.15	0 −0.15	19	0 −0.210		
5×6.5×16	5		6.5	5.2			16			
5×7.5×19	5		7.5	6.0			19			
5×9×22	5		9.0	7.2			22			
6×9×22	6		9.0	7.2	0 −0.18	0 −0.18	22	0 −0.210		
6×10×25	6		10.0	8.0			25			
8×11×28	8		11.0	0	8.8	0 −0.18	0 −0.18	28	0.40	0.60
10×13×32	10		13.0	−0.18	10.4			32		

NOTES:

(1) This form shall only be used by agreement between the supplier and customer.

(2) Height h_2 is based on 0.8 times height h_1 .

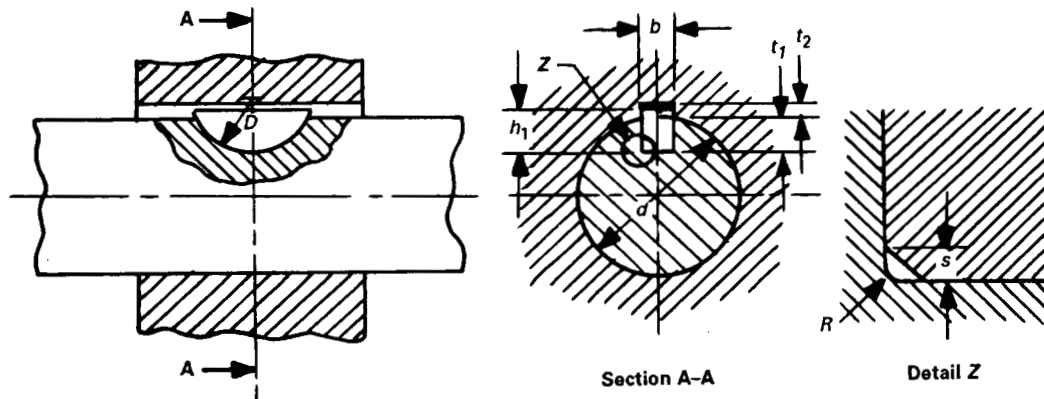


TABLE 2 DIMENSIONS FOR WOODRUFF KEYWAYS

Key Size $b \times h_1 \times D^2$	Keyway											
	Width						Depth				Radius, R	
	Basic Size	Tolerance [Note (1)]					Shaft, t_1		Hub, t_2			
		Normal Fit		Close Fit	Free Fit							
		Shaft N9	Hub JS9	Shaft and Hub P9	Shaft H9	Hub D10	Basic Size	Tolerance	Basic Size	Tolerance	Max.	Min.
1×1.4×4	1							1.0		0.6		
1.5×2.6×7	1.5							2.0		0.8		
2×2.6×7	2	-0.004	+0.0125	-0.006	+0.025	+0.60	1.8	+0.1 0	1.0		0.16	0.08
2×3.7×10	2	-0.029	-0.0125	-0.031	0	+0.20	2.9		1.0			
2.5×3.7×10	2.5						2.7		1.2			
3×5×13	3						3.8		1.4	+0.1 0		
3×6.5×16	3						5.3		1.4			
4×6.5×16	4						5.0	+0.2 0	1.8		0.25	0.16
4×7.5×19	4						6.0		1.8			
5×6.5×16	5	-0.030	+0.015	-0.012	+0.030	+0.078	4.5		2.3			
		0	-0.015	-0.042	0	+0.030	5.5		2.3			
5×7.5×19	5											
5×9×22	5						7.0		2.3			
6×9×22	6						6.5		2.8			
6×10×25	6						7.5	+0.3 0	2.8			
8×11×28	8	0	+0.018	-0.015	+0.036	+0.098	8.0		3.3	+0.2 0	0.4	0.25
		-0.036	-0.018	-0.051	0	+0.040						
10×13×32	10						10.0		3.3			

NOTES:

(1) Note that some of the tolerances are expressed as plus-plus or minus-minus. See para. 1.4 for more information.

(2) The nominal key diameter is the minimum keyway diameter.

AMERICAN NATIONAL STANDARDS FOR BOLTS, NUTS, RIVETS, SCREWS, WASHERS, AND SIMILAR FASTENERS

Small Solid Rivets	B18.1.1-1972(R1995)
Large Rivets	B18.1.2-1972(R1995)
Metric Small Solid Rivets	B18.1.3M-1983(R1995)
Square and Hex Bolts and Screws — Inch Series	B18.2.1-1981(R1992)
Square and Hex Nuts (Inch Series)	B18.2.2-1987(R1993)
Metric Hex Cap Screws	B18.2.3.1M-1979(R1995)
Metric Formed Hex Screws	B18.2.3.2M-1979(R1995)
Metric Heavy Hex Screws	B18.2.3.3M-1979(R1995)
Metric Hex Flange Screws	B18.2.3.4M-1984(R1995)
Metric Hex Bolts	B18.2.3.5M-1979(R1995)
Metric Heavy Hex Bolts	B18.2.3.6M-1979(R1995)
Metric Heavy Hex Structural Bolts	B18.2.3.7M-1979(R1995)
Metric Hex Lag Screws	B18.2.3.8M-1981(R1991)
Metric Heavy Hex Flange Screws	B18.2.3.9M-1984(R1995)
Metric Hex Nuts, Style 1	B18.2.4.1M-1979(R1995)
Metric Hex Nuts, Style 2	B18.2.4.2M-1979(R1995)
Metric Slotted Hex Nuts	B18.2.4.3M-1979(R1995)
Metric Hex Flange Nuts	B18.4.4.4M-1982(R1993)
Metric Hex Jam Nuts	B18.2.4.5M-1979(R1990)
Metric Heavy Hex Nuts	B18.2.4.6M-1979(R1990)
Socket Cap, Shoulder and Set Screws — Inch Series	B18.3-1986(R1995)
Socket Head Cap Screws (Metric Series)	B18.3.1M-1986(R1993)
Metric Series Hexagon Keys and Bits	B18.3.2M-1979(R1990)
Hexagon Socket Head Shoulder Screws (Metric Series)	B18.3.3M-1986(R1993)
Hexagon Socket Button Head Cap Screws (Metric Series)	B18.3.4M-1986(R1993)
Hexagon Socket Flat Countersunk Head Cap Screws (Metric Series)	B18.3.5M-1986(R1993)
Metric Series Socket Set Screws	B18.3.6M-1986(R1993)
Round Head Bolts (Inch Series)	B18.5-1990
Metric Round Head Short Square Neck Bolts	B18.5.2.1M-1981(R1995)
Metric Round Head Square Neck Bolts	B18.5.2.2M-1982
Round Head Square Neck Bolts With Large Head (Metric Series)	B18.5.2.3M-1990
Wood Screws (Inch Series)	B18.6.1-1981(R1991)
Slotted Head Cap Screws, Square Head Set Screws, and Slotted Headless Set Screws	B18.6.2-1972(R1993)
Machine Screws and Machine Screw Nuts	B18.6.3-1972(R1983)
Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)	B18.6.4-1981(R1991)
Metric Thread Forming and Thread Cutting Tapping Screws	B18.6.5M-1986(R1993)
Metric Machine Screws	B18.6.7M-1985(R1993)
General Purpose Semi-Tubular Rivets, Full Tubular Rivets, Split Rivets and Rivet Caps	B18.7-1972(R1992)
Metric General Purpose Semi-Tubular Rivets	B18.7.1M-1984(R1992)
Clevis Pins and Cotter Pins (Inch Series)	B18.8.1-1994
Taper Pins, Dowel Pins, Straight Pins, Grooved Pins, and Spring Pins (Inch Series)	B18.8.2-1995
Spring Pins — Coiled Type (Metric Series)	B18.8.3M-1995
Spring Pins — Slotted (Metric Series)	B18.8.4M-1994
Machine Dowel Pins — Hardened Ground (Metric Series)	B18.8.5M-1994
Cotter Pins (Metric Series)	B18.8.6M-1995
Headless Clevis Pins (Metric Series)	B18.8.7M-1994
Headed Clevis Pins (Metric Series)	B18.8.8M-1994
Plow Bolts	B18.9-1958(R1995)
Track Bolts and Nuts	B18.10-1982(R1992)
Miniature Screws	B18.11-1961(R1992)
Glossary of Terms for Mechanical Fasteners	B18.12-1962(R1991)
Screw and Washer Assemblies — Sems (Inch Series)	B18.13-1987(R1993)
Screw and Washer Assemblies — Sems (Metric Series)	B18.13.1M-1991
Forged Eyebolts	B18.15-1985(R1995)
Mechanical and Performance Requirements for Prevailing-Torque Type Steel Metric Hex Nuts and Hex Flange Nuts	B18.16.1M-1979(R1995)
Torque-Tension Test Requirements for Prevailing-Torque Type Steel Metric Hex Nuts and Hex Flange Nuts	B18.16.2M-1979(R1995)

Dimensional Requirements for Prevailing-Torque Type Steel	
Metric Hex Nuts and Hex Flange Nuts	B18.16.3M-1982(R1993)
Wing Nuts, Thumb Screws, and Wing Screws	B18.17-1968(R1983)
Inspection and Quality Assurance for General Purpose Fasteners	B18.18.1M-1987(R1993)
Inspection and Quality Assurance for High-Volume Machine Assembly Fasteners	B18.18.2M-1987(R1993)
Inspection and Quality Assurance for Special Purpose Fasteners	B18.18.3M-1987(R1993)
Inspection and Quality Assurance for Fasteners for Highly Specialized	
Engineered Applications	B18.18.4M-1987(R1993)
Lock Washers (Inch Series)	B18.21.1-1994
Lock Washers (Metric Series)	B18.21.2M-1994
Metric Plain Washers	B18.22M-1981(R1990)
Plain Washers	B18.22.1-1965(R1990)
Square and Rectangular Keys and Keyways	B18.25.1M-1996
Woodruff Keys and Keyways	B18.25.2M-1996
Helical Coil Screw Thread Inserts (Inch Series)	B18.29.1-1993

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