AMERICAN NATIONAL STANDARD

Preferred Metric Sizes for Round, Square, Rectangle and Hexagon Metal Products

ANSI B32.4M - 1980

(REVISION OF ANSI B32.4-1977)

REAFFIRMED 1994

FOR CURRENT COMMITTEE PERSONNEL
PLEASE SEE ASME MANUAL AS-11

SECRETARIAT

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

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FOREWORD

The U.S. Department of Commerce in its July 1971 report to Congress titled "A Metric America—A decision whose time has come" recommended that the United States should change to the metric system through a coordinated national program. This action along with subsequent increased metric activity in industry resulted in a number of requests from producers and users that the B32 committee develop preferred series of metric sizes for the various forms of wrought mill metal products.

On January 17, 1973 Subcommittees 1 and 2 were formed to establish preferred metric sizes of flat and round metal products respectively. Subsequently Subcommittee 2 had its scope enlarged to include square and hexagon products. Subcommittee 4 was formed on October 24, 1973, to consider tubular products. These committees are composed of representatives of the major metal trade associations and user groups.

After several meetings, unanimous agreement was reached by Subcommittee 2 on the preferred metric sizes for round, square and hexagon wrought metal products. These considerations guided the committee: preferred number sizes included in ISO recommendations R 388, sizes actually used in metric countries, and rounded metric equivalents of high activity inch sizes used in the United States.

Sizes in Table 3 agree in all instances with hexagon metric fastener sizes.

The proposal received Standards Committee B32 approval on June 4, 1974. It was subsequently approved by the sponsor and submitted to the American National Standards Institute for designation as an American National Standard. This was granted on July 9, 1974.

The First Edition was very favorably received and the dynamic metrication planning activity which it generated prompted the Committee to expand the coverage. Requests were received to issue separate tables for squares and hexagons and to establish a series of preferred lengths within the limits of Tables 1, 2 and 3 which are supplied in straight lengths. This was done after due deliberation. In addition fourteen third preference diameters were added.

The Second Edition proposal received Standards Committee B32 approval on August 17, 1976, and was approved as an American National Standard on April 7, 1977.

The Third Edition incorporates rectangles not previously covered in ANSI B32.3. This proposal received Standards Committee B32 approval on December 10, 1979 and was approved as an American National Standard on April 14, 1980.

AMERICAN NATIONAL STANDARDS COMMITTEE B32
Standardization of Metal and Metal Alloy Wrought Mill Product Nominal Sizes

(The following is the roster of the committee at the time of the approval of the standard)

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AMERICAN NATIONAL STANDARD

PREFERRED METRIC SIZES FOR ROUND, SQUARE, RECTANGLE AND HEXAGON METAL PRODUCTS

1. SCOPE

This standard establishes preferred series of metric sizes for round, square, rectangle and hexagon metal products.

2. GENERAL

The sizes in this Standard provide an orderly series of sizes for each of four forms of metal products used for general purpose applications. The series were developed to provide a reasonable selection of metal diameters from 0.020 to 320 millimeters for rounds and distance across flats from 3 to 300 millimeters for squares, various cross section sizes from 1.6 by 10 to 100 by 200 millimeters for rectangles, and from 1.5 to 150 millimeters for hexagons. The series provides for some second and third preference diameters for rounds and second preference distance across flats for squares and hexagons where selection from the primary preferred sizes may be inadequate. No second preference sizes are listed for rectangles. The series also provides for preferred lengths of rounds, squares, rectangles and hexagons. Sufficient coverage in logical steps is presented in the tables to adequately serve most of the general purpose requirements of industry for round, square, rectangle and hexagon metal products.

It is recognized that for some applications, particularly large volume requirements in some metals for specific end uses, precise engineering requirements dictate a need for sizes other than those presented in this standard. This Standard is in no way meant to preclude the use of such sizes where they are required. However, for general purpose applications, or where requirements permit some latitude in the selection of sizes, the simplified preferred sizes given in this standard should facilitate interchangeability of metals in design, reduce inventories, and increase the availability in warehouse stocks of those sizes commonly used for general purpose applications. In such instances the use of sizes listed in this standard is to be encouraged.

All the sizes included in this standard are not necessarily produced in all metals and grades. Producers or distributors must be consulted to determine availability of a particular size for a given metal product.

3. USE OF TABLE

Wherever possible sizes should be selected from the column headed "Preferred Sizes". Only if no size in the preferred list is suitable should a selection be made from the columns headed "Second Preference Sizes", and "Third Preference Sizes" as applicable.

4. BASIS OF TABLES

Most of the preferred sizes are derived from the 10 series of preferred numbers (American National Standard Preferred Numbers, Z17.1-1973). A few sizes are derived from the 20 and 40 series.

Most of the second preference sizes are derived from the 20 series preferred numbers. Third preference sizes when included are generally derived from the 40 series preferred numbers.

Some deviations from the preferred series occur as the result of rounding and as the result of demonstrated or anticipated need for sizes other than those which follow the above preferred series.

Table 1 — Preferred Diameters of Round Metal Products (in millimeters)

Preferred Sizes	Second Preference Sizes	Third Preference Sizes
0.020		
	0.022	
0.025		
	0.028	
0.030		
	0.035	
0.040		
	0.045	
0.050		
	0.055	
0.060		
	0.065	
	0.070	
0.080		
	0.090	
0.10		
	0.11	
0.12		
	0.14	
0.16		
	0.18	
0.20		
	0.22	
0.25		
	0.28	
0.30		
	0.35	
0.40		
	0.45	
0.50		
	0.55	
0.60		
	0.65	
	0.70	
0.80		
	0.90	
1.0		
	1.1	
1.2		
		1.3
	1.4	
1.6		
	1.8	
2.0		
		2.1
	2.2	
		2.4
2.5		
		2.6
	2.8	
3.0		
		3.2
	3.5	
		3.8
4.0		
		4.2
	4.5	
		4.8
5.0		
	5.5	
6.0		
	6.5	
	7.0	
		7.5
8.0		
		8.5
	9.0	
		9.5
10		
	11	
12		
	13	
14		
	15	
16		
	17	
18		
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20		
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22		
	23	
	24	
25		
	26	
	28	
30		
	32	
35		
		36
	38	
40		
	42	
45		
	48	
50		
	55	
60		
	65	
	70	
	75	
80		
		85
	90	
		95
100		
	110	
120		
	130	
140		
	150	
160		
	170	
180		
	190	
200		
	220	
250		
	280	
300		
	320	

Table 2 — Preferred Across Flat Sizes of Square Metal Products (in millimeters)

Preferred Sizes	Second Preference Sizes
3.0	
4.0	
5.0	
6.0	
8.0	
10	
12	
	14
16	
	18
20	
	22
25	
	28
30	
	35
40	
	45
50	
	55
60	
	70
80	
	90
100	
	110
120	
	140
160	
	180
200	
	220
250	
300	

Table 3 – Preferred Across Flat Sizes of Hexagon Metal Products (in millimeters)

Preferred Sizes	Second Preference Sizes	Preferred Sizes	Second Preference Sizes
	1.5		22
	2.0	24	
	2.5	27	
3		30	
4			32
5		34	
	5.5	36	
6		41	
	7	46	
8		50	
10		55	
12		60	
	13	70	
14		80	
	15	90	
16		100	
	17	110	
18		120	
	19	135	
21		150	

Table 4 – Preferred Lengths of Round, Square, Rectangle and Hexagon Metal Products (in millimeters)

Preferred Sizes
1000
2000
2500
3000
3500
3700
4000
4500
5000
6000
8000
10 000
12 000
14 000
16 000
18 000

Table 5 — Preferred Across Flat Sizes of Rectangular Metal Products (in millimeters)

Preferred Sizes