

U S A S T A N D A R D

PREFERRED DIAMETERS FOR ROUND WIRE - 0.500 inches and under

USAS B32.2-1969

REAPPROVED '79

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FOREWORD

USA Standards Committee B32 had its beginning on November 27, 1928 when it was requested to take up the unification of the various systems employed in gaging wire and sheet metal. Although there were extended periods of inactivity, *USAS Standard B32.1, Preferred Thicknesses for Uncoated Thin Flat Metals* was issued in 1941. It was revised in 1952 and reaffirmed in 1959 and again in 1966.

An attempt at standardizing round wire sizes to replace arbitrary (gage) numbers in order to eliminate the multiplicity of gages for wires of various metals was made in a proposal in September 1941. This proposal was never balloted. There was no further activity until October 25, 1965 when it was agreed to again study a standard series of sizes for general purpose round wire. The result was a proposal covering sizes from 0.010-through 0.500-inch diameter.

In the initial proposal, sizes from 0.250-through 0.500-inch diameter followed the preferred fraction series, well established in the United States. Sizes under 0.250-inch diameter followed an arbitrary decimal fraction series of preferred inch values. Subsequently, to prevent significant future problems and since no precedent had been established for the decimal size of wire under 0.250 other than arbitrary gages, consideration was given to selecting sizes compatible between the two measuring systems. The resulting proposal established decimal inch sizes corresponding to the preferred millimeter sizes of *ISO Recommendation R 388, Metric Series for Basic Thicknesses of Sheet and Diameters of Wire*, for sizes under 0.250-inch diameter, and retained the well established preferred fraction inch sizes (expressed in decimals) for sizes from 0.250-through 0.500-inch diameter. This proposal received approval as a USA Standard on August 22, 1969.

USA Standards Committee B32
on
Standardization of Wire Diameters and Metal Thicknesses

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USA STANDARD

PREFERRED DIAMETERS FOR ROUND WIRE
(0.500 Inches and Under)

GENERAL

The diameters in this Standard provide an orderly series of round wire sizes, in thousandths of an inch, applicable to metals and alloys used for general purpose applications (except electrical conductors). This series is designed to provide a reasonable selection of wire diameters from 0.500 inch to 0.010 inch, indicating those diameters to be given primary consideration, together with intermediate sizes to be employed where the primary preferred diameter may not be suitable. Sufficient size coverage in logical steps is presented in the tables to adequately serve most of the general purpose needs of industry for wire sizes 0.500 inch and under.

It is recognized that for many applications, especially tonnage requirements in some metals for specific end uses, precise engineering requirements may determine that decimal diameters should be chosen other than those in the series presented here. This Standard is in no sense meant to construe that such deviations from this Standard should not continue to be recognized. However, for general purpose applications, where the design, engineering, and manufacturing conditions permit some latitude, the use of diameters listed in the table are to be encouraged.

The use of this diameter series will facilitate interchangeability of different metals and alloys in design, reduce inventory requirements, and increase the availability in warehouse stocks of diameters commonly required for various general purpose applications.

EXCLUSION

This Standard is not applicable to, nor intended for use in the field of electrical conductors. Appropriate standard diameters for round wires

used as electrical conductors are published elsewhere. Specific reference is to USA Standard C7.36 which, relates solely to conductor wires.

USE OF TABLE

Wherever possible, diameters should be selected from the left column headed "Preferred Wire Size." If no size in the preferred listing is suitable, selection should be made from the next column headed "First Intermediate Wire Size." Only if needs cannot be fulfilled by selection from either of these columns should the last column "Second Intermediate Wire Size" be employed. It will be noted that in the coarsest sizes (over 0.359 inch) and in the finest sizes (under 0.030 inch), the preferred diameters are restricted to the first two columns only.

BASIS OF TABLE

The diameters in the table for sizes 0.500 to 0.250 inch, inclusive, are the rounded decimal equivalents in inches of the fractional preferred numbers (from 1/2 to 1/4, inclusive) listed in Table II of the USA Standard Preferred Numbers, Z17.1-1965. In the table for this range of diameters, the Preferred Wire Sizes (as rounded to the closest 0.001") correspond to fractional sixteenths of an inch; the First Intermediate Wire Sizes correspond to thirty-seconds of an inch; and the Second Intermediate Wire Sizes correspond to sixty-fourths of an inch.

For sizes under 0.250 inch, the three columns of diameters in the table correspond to the inch equivalents (rounded to the closest .001") of the R 10, R 20, and R 40 sizes of ISO Recommendation R 388, which is the ISO Metric Series for Basic Thicknesses of Sheet and Diameters of Round Wire.

The metric equivalents of the standard decimal inch diameters are given for information purposes only.

USA STANDARD PREFERRED DIAMETERS FOR
ROUND WIRES (0.500 Inches and Under)

USAS B32.2-1969

TABLE OF
PREFERRED DIAMETERS FOR ROUND WIRE (IN INCHES)

Preferred Wire Size Inch	First Intermediate Wire Size-Inch	Second Intermediate Wire Size-Inch	mm Equivalent* (For Information)
0.500			12.70
	0.469		11.91
0.438			11.13
	0.406		10.31
0.375			9.52
	0.344	0.359	9.12
			8.74
		0.328	8.33
0.312			7.92
	0.281	0.297	7.54
			7.14
		0.266	6.76
0.250			6.35
		0.236	6.00
	0.220		5.60
		0.209	5.30
0.197			5.00
	0.177	0.187	4.75
			4.50
		0.167	4.25
0.158			4.00
	0.140	0.148	3.75
			3.55
		0.132	3.35
0.124			3.15
		0.118	3.00
	0.110		2.80
		0.104	2.65
0.098			2.50
	0.088	0.093	2.36
			2.24
		0.084	2.12
0.079			2.00
	0.071	0.075	1.90
			1.80
		0.067	1.70
0.063			1.60
	0.056	0.059	1.50
			1.40
		0.052	1.32
0.049			1.25
	0.044	0.046	1.18
			1.12
		0.042	1.06
0.039			1.00
	0.035	0.037	0.95
			0.90
		0.033	0.85
0.032			0.80
		0.030	0.75
	0.028		0.71
0.025			0.63
	0.022		0.56
0.020			0.50
	0.018		0.45
0.016			0.40
	0.014		0.355
0.012			0.315
	0.011		0.280
0.010			0.250

*For sizes 0.250 inch and coarser, the mm equivalent column reflects directly converted millimeter values rounded to the nearest 0.01 mm; for sizes under 0.250 inch, the values are the ISO R 388 basic millimeter sizes.

**USA STANDARDS FOR
STANDARDIZATION OF WIRE DIAMETERS AND METAL THICKNESS**

Preferred Thickness for Uncoated, Thin, Flat Metals (Under 0.250 Inches)	B32.1-1952 (Reaf. 1959)
Preferred Diameters for Round Wire (0.500 Inches and Under)	B32.2-1969

Binders for holding standards are available.

A complete list of USA Standards published by The American Society of Mechanical Engineers
obtainable upon request.

