

Chapter 11

Nonferrous Material

SUMMARY

Only copper and aluminum products are covered in this chapter. Major industrial countries, such as Japan, Germany, France, and Italy, have produced nonferrous material dimensioned to metric modules for a number of years, and the material standards¹ for nonferrous sizes reflect the available commercial sizes in these countries.

The American National Standards Institute issued American National Standards B32.100-2005 for preferred metric sizes for flat, round, square, rectangular, and hexagonal metal products. The preferred metric sizes were the result of the informational input of representatives from industries and professional societies, as well as the experience of other countries where the metric system has been in use.

DESCRIPTION OF TABLES

The nonferrous material dimension tables given in this chapter list standard metric sizes produced in major countries using the metric system. Linear dimensions, section areas, and mass per length of area are shown both in SI units and in customary inch units in the left-hand portions of each table. The left-most columns in the tables, which are headed in vertical fashion by ISO, ANSI, DIN, or BS, indicates the preference rating in the appropriate standard from which the metric sizes are chosen. In the right-hand portions of the tables, national standards for the applicable products are listed with their specified preference ratings.

Tolerances shown in the right-hand portions of the tables are in millimeters, and are listed by column under a heading noting the original standard. Most of the tolerances are specified within the ISO system of limits and fits which is covered in national product standards throughout the world.

All conversions and calculations were processed by a computer, and the data shown are rounded off to the nearest number in each case. The computer exponential "E" format (see Table 2-2) was selected in order to cover a wide range of sizes and at the same time present a three-significant-digit accuracy for all numbers shown. The maximum error range is from 0.5% to 0.05%. The standard density for copper used is 8900 kg mass per cubic meter, and for aluminum, 2700 kg mass per cubic meter. The density is not constant, and varies with added alloying materials.

WORLD STANDARDS FOR NONFERROUS PLATE AND SHEET

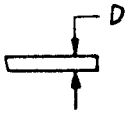
Table 11-1. Cold Rolled Copper and Copper Alloy Sheets (ANSI B32.100). The nominal thicknesses in the range from 0.1 to 10 mm have been based on the ANSI B32.100 standard, and the tolerances shown are based on DIN 1751 for cold rolled copper sheets.

Table 11-2. Cold Rolled Aluminum and Aluminum Alloy Sheets (ANSI B32.100). Aluminum sheets are shown in sizes ranging from 0.25 to 15 mm thicknesses with preference ratings as specified in ANSI B32.100. The tolerances shown are for aluminum sheets of Material Group I in DIN 1783, which is applicable for most aluminum sheet products.

Table 11-3. Cold Rolled Copper and Copper Alloy Plates (ANSI B32.100). Copper plates in thicknesses from 3 to 50 mm are shown in Table 11-3, and the selection of sizes has been based on ANSI B32.100. The tolerances listed are those specified in the Japanese Standard JIS H3111 for oxygen-free copper sheets and plates.

Table 11-4. Hot Rolled Aluminum and Aluminum Alloy Plates (ANSI B32.100). Hot-rolled aluminum plates in thicknesses from 5 to 100 mm have been selected from ANSI B32.100, and some tolerances from DIN 59600 for sheets and rounds made of hot rolled aluminum are also shown.

TABLE 10-1A HOT-ROLLED STEEL SHEET AND STRIP THICKNESSES (ANSI B32.100)



SIZE		MASS kg/m ²	USA	AUSTRAL	JAPAN	FRANCE	UK	GERMANY	ITALY
ANSI B32.100	D mm		ANSI B32.100	AS 1594	JIS G3193	NF A46-501	BS 1449	DIN 1016	UNI
F	1	7.85	F	F		F	F	F	F
T	1.1	8.63	T	S					
S	1.2	9.42	S	F	F	1.25F	F		
T	1.4	11.0	T	S	F				
T	1.5	11.8	T			F		F	
F	1.6	12.6	F	F	F		F		
T	1.7	13.7	T			F		F	
T	1.8	14.1	T	S	F				
S	2	15.7	S	F	F	F	F	F	
T	2.2	17.3	T, 2.3T	S	2.3F	2.25F			
F	2.5	19.6	F	F	F	F	F	F	
T	2.8	22.0	T	S	F, 2.6S				
S	3	23.5	S	F	2.9S	F	F	F	
T	3.2	25.1	T		F				
T	3.5	27.5	T	S		F			
T	3.8	29.8	T		3.6F				
F	4	31.4	F	F	F	F	F	F	
	4.2	33.0							
T	4.5	35.3	T	S	F	F			
	4.8	37.7				4.75F			
S	5	39.2	S	F	F	F	F	F	
T	5.5	43.2	T	S	5.6F				
F	6	47.1	F	F	F	F	F	F	
T	7	54.9	T	S	F, 6.3F	F			
S	8	62.8	S	F	F	F	F	F	
T	9	70.6	T	S	F				
F	10	78.5	F	F	F		F	F	
T	11	86.3	T		F				
S	12	94.2	S		F		F	12.5F	

NOTES:

1. Mass is calculated on the basis of density of steel of 7.85 kg/dm³.
2. The size is national standard as indicated; F = First Choice; S = Second Choice; T = Third Choice; Number = Other Size.
3. Tolerances are shown in Tables 10-1B-10-1H.