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PRINCIPLES OF CONVERSION

SRI LANKA STANDARDS INSTITUTION

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SRI LANKA STANDARD
FOR PRINCIPLES OF CONVERSION

FOREWORD

This Sri Lanka Standard was prepared under the authority of the Metric Divisional Committee of the Sri Lanka Standards Institution and was authorised for adoption and publication by the Council of the Institution on 1971-10-27.

The Government has decided to adopt the Metric System of Weights and Measures in Sri Lanka. With this decision it became necessary to prepare a publication giving Principles of Conversion from one system of units to another, particularly from the Imperial System to the Metric System (SI) and vice versa. This Sri Lanka Standard sets out to do this and is intended for the guidance of engineers, designers and technologists.

In preparing this Standard reference has been made to the following publications :

IS 787 - 1956	:	Guide for Inter-Conversion of Values from one system of units to another.
BS 1957 - 1953	:	Presentation of Numerical Values.
ASTM E29 - 50	:	Recommended Practice for Designating Significant Places in Specified values.

1 SCOPE

This standard is intended to serve as a guide in converting numerical values of physical quantities from one system of units of measurement to another system of units.

2 TERMINOLOGY

For the purpose of this standard the following definitions shall apply :

2.1 **Significant Figures** - A value is said to have as many significant figures as there are number of figures obtained by counting to the right from the first non-zero figure on the left.

2.2 Significant Part - It consists of the significant digits occurring in the value written down as an integral number without a decimal point and without the non-significant zeros.

Examples :

Value	Significant Figures	Significant Part
0.621 371	6	621 371
0.042 140	5	42 140
1550.00	6	155 000
$6.102\ 37 \times 10^4$	6	610 237
2.00	3	200
0.000 001	1	1
2 000.000 001	10	2 000 000 001

2.3 Order of Magnitude - Two numbers are referred to in this standard as having the same order of magnitude if the greater one is not more than ten times the smaller.

Examples :

The following pairs of values are of the same order of magnitude :

3.2 and 32
2.54 and 12
1.69 and 0.497 2
1 000 and 101.35
1 756 049 and 15.2×10^6

3 CONVERSION FACTORS

3.1 Principal Conversion Factors

Principal conversion factors include key (fundamental) factors and derived factors which are frequently needed for conversion from one system of units to another. The key (fundamental) factors constitute a set of factors containing the information which is necessary and sufficient for the derivation of the other factors. The key (fundamental) factors given in Table 1 shall be used in the inter-conversion of commonly occuring quantities from one system of units to another.

TABLE 1. KEY (FUNDAMENTAL) FACTORS

Length	1 inch	=	25.4 millimetres (exactly)
	1 metre	=	3.280 84 feet
Mass	1 pound	=	0,453 592 37 kilogramme
	1 kilogramme	=	2.204 62 pounds

Time

In the case of time no conversions would arise as the same units second, minute and hour will be used.

Temperature

9 degree fahrenheit = 5 kelvins
= 5 degree celsius

Electric Current

In the case of electric current no conversions would arise as the only system of measurement is the metric system (**SI**).

Illumination

1 foot-candle = 10.763 9 lux or lumen* per square metre

Derived conversion factors for some of the commonly used units are given in Appendix **A**.

More comprehensive conversion factors and tables have been published as a separate standard (See SLS 99 - 1970).

4 KINDS OF NUMERICAL VALUES

4.1 For the purpose of this Sri Lanka Standard, numerical values will be regarded as being of three different kinds viz. exact terminating values, inexact values for exact quantities and **inexact** values subject to inherent uncertainty.

4.2 **Exact Terminating Values** - These are expressed to as many significant figures as may be necessary to give the complete value, **without** any approximation or uncertainty or tolerance.
Many definitive values are of this kind.

Examples : 100 centimetres in a metre, 1 degree interval on the Celsius scale is exactly 1,8 degrees interval on the Fahrenheit scale, 100 years in a century etc.

**1 lumen = 1 candela steradian*

It will be seen that such values generally constitute a category of conversion factors of one sort or another. Thus, they will not require to be converted from one system of units to another.

4.3 Inexact Values for Exact Quantities

These are exactly defined values which remain inexactly stated when expressed as a decimal fraction. These can be expressed to any desired accuracy by carrying the decimal fraction to as many places as may be necessary for the particular purpose.

Examples : $\log_{10}2 = 0.301\ 030$

$\sqrt{2} = 1.414\ 21$

$1\ 7 = 0.142\ 857\ 142$

Again it will be noted that such values will not be required to be converted from one set of units to another.

4.4 Inexact Values Subject to Inherent Uncertainty

These include most of the values representing physical quantities and certain dimensionless quantities such as percentages and ratios. Experimentally determined values fall into this category. These may be further sub-divided into :

(a) Unqualified single number values

(b) Maximum and Minimum single number/values

(c) Multiple values including statement of precision

4.4.1 *Unqualified Single Number Values*

These are values which are stated without qualification as to being maximum or minimum and/or without any reference to a defined or implied accuracy, uncertainty or tolerance.

Generally for such values, supplementary information is given regarding the degree of accuracy required or implied according to trade usage or engineering practice. Such information should be made use of in converting these quantities.

In the absence of any guidance as to the degree of accuracy implied, the accuracy of the value should be assumed to be $\pm$ 0.5 of the unit in the last significant place. However, in applying this rule considerable caution should be exercised to preserve the accuracy necessary to be maintained in conversion. If a higher order of accuracy or tolerance than that represented by one-half of a unit in the last significant place were desired or intended, the author of the figure should have either carried the figure to another significant place or stated its tolerance or error. In the absence of any such statement, the user of the figure is entitled to assume that the author has given the figure accurate to the nearest unit in the last significant place.

There is one drawback in this assumption that most authors, writers of specifications and designers are likely to drop the zeros at the end of a decimal fraction, even if significant, and to retain zeros at the end of an integral number, even if non-significant.

Therefore, until the recommended practice of retaining all significant zeros and eliminating all non-significant zeros becomes commonly adopted, it is essential that this rule be applied with extreme caution.

For example : In the absence of a clue to the possible or intended accuracy.

dimensions specified on a drawing as 5.5 mm may be taken to be accurate to ± 0.05 mm. It is obvious that the 5.5 mm dimensions stated on a drawing without a tolerance could not have been intended by the designer or draftsman to be 5.4 or 5.6 mm, for he would have stated it as such. The values 5 45 and 5 55 would be rounded off to 5.4 and 5.6 respectively according to SLS 102 : 1971 (Presentation of Numerical Values) and again the values 5.45 + and 5.55- would both be rounded off to 5.5. Therefore it is reasonable to assume that the designer's intention was to imply an accuracy of ± 0.05 mm in his statement of the 5.5 mm dimension. It may be objected that the designer might have stated 5.5 mm but meant to imply 5.50 mm or even 5.500 mm. But it is normal to state a tolerance when dimensions are intended to be so exact. Therefore it is recommended that whenever a zero is intended to be significant it shall be included and whenever it is not included it may be taken not to be significant.

the tolerance of the length of a battery lead specified as 4½ in. in a specification may be assumed to be ± 0.25 in. The 4½ in. length of bettery lead may be safely taken to be between 4¼ in. and 4¾ in, but if the dimension for such a lead is specified, say, 4 in, then careful consideration has to be given in assuming its permissible variation to be ± ½ in. Therefore, there is considerable room for caution in the use of this general rule even in cases of relatively unimportant dimensions. In general, it is recommended that for vulgar fractions directions given below may be followed.

In case of vulgar fraction values, particularly for inches, it is not always possible to assume the accuracy to be ± ½ of the fractional part of the value as the order of magnitude of the accuracy depends mostly on the type of dimension involved. A statement such as 'Cut 4½ in. blanks from a rod for further machining' certainly implies a higher degree of accuracy than ± ¼ in. Therefore, in all cases of vulgar fractions before proceeding to convert a value to metric or other units, it is advisable to convert the vulgar fraction to a decimal fraction first and then express it to the degree of accuracy appropriate for the purpose. For example, the 1½ in. blank for machining may be taken to be 1.5 in. so that its implied accuracy is ± 0.05 in.

(c) a pH measurement test result of 2.5 may be taken to be accurate to ± 0.05 units of pH. The reporting authorities are not prone to state a result of a test in a fewer number of significant figures than actually obtained by measurement or as may be derived through calculations based on measured values. Therefore, in the case of a statement of a result of measurement such as the pH, chemical composition, strength of a test piece etc, there is little danger of going wrong in assuming the order of accuracy recommended here.

4.4.2 *Maximum and Minimum Single Number Values*

These include specification values, values expressing result of an experiment, expectation of an operation, limit, capacity or possibility of achievement, etc.

Examples : (a) The maximum chloride content of an edible product is 1.1%.

(b) The maximum moisture content of Timber is 15%.

(c) The minimum tensile strength of steel is 4.2 MPa* (42.3 kgf cm^2).

In some cases, tolerance limits or uncertainty of estimates are sometimes found associated with maximum and minimum values. For instance, there is no point in stating that the minimum tensile strength of steel shall be 4.2 ± 0.1 MPa (42 ± 1 kgf/cm^2). It will be noted, that a single value statement of 4.1, 4.2 or 4.3 MPa (41, 42 or 43 kgf/cm^2) as the minimum tensile strength will be much more appropriate and unambiguous.

For the purpose of conversion of maximum and minimum single number values from one system of units to another, it should be determined whether the number of significant figures appearing in the stated value adequately expresses its precision or whether the method of measurement expected to be employed or the character of requirement intended to be imposed would normally require additional significant figures to be added to the value to achieve the desired degree of precision in the stated value. If such be the case, an additional zero may be added to the stated value and considered significant for the purpose of conversion.

4.4.3 *Multiple Number Values including Statement of Precision*

These include most precision dimensions on engineering drawings, specification values requiring close inspection limits, results of accurate measurements etc.

Examples : (a) Acceleration due to gravity as determined in the experiment was 32.191 05 ± 0.000 02 ft per second squared.

It is quite safe to convert values like this expressing experimental results just as they stand, for the precision of both the main value and the error may each be taken to be adequately included in the statement.

**1 pascal (Pa) = 1N/m^2*

(b) The wire diameter shall be $1.8\ ^{+0.000\ 02}_{-0.000\ 47}$ in.

(c) Internal diameter of the collar shall be $1\frac{3}{8}\ ^{+0.003}_{-0.000\ 2}$ in.

(d) Distance between centres of two holes shall be $1\frac{3}{4} \pm 0.015$ in.

These three cases may be considered together as these values are concerned with precision dimensions intended to ensure interchangeability of parts. For the purpose of conversion, these values should be re-written so that the number of decimal places in both the main dimensions and in the tolerances are the same. In the case of vulgar fraction values too the number of decimal places to be retained in the decimal version of the value should be the same as that in the tolerance value.

NOTE : For the purpose of this standard, it is recommended that the precision of a stated tolerance may be taken to be ± 5 percent for tolerances 0 001 in. or coarser and ± 0.000 05 in. for tolerances finer than 0.001 in. Thus in rewriting tolerance limits for inch dimension for conversion purposes, it will suffice to add one zero to all tolerances of any magnitude having one significant figure, provided no zero is added beyond the fifth place of decimal fraction in inches. This procedure also implies that the converted values neep not be rounded to a fineness closer than 0.000 05 in or 0 001 mm. Similarly for rewriting millimetre dimensions for conversion, one significant zero may be added to all one significant figure limits, provided no zero is added beyond the third place of decimals. No change need be made in rewriting tolerance limit values if there are two or more significant figures irrespective of whether they are in inches or millimetres.

i.e. (b) Wire Diameter : $1.800\ 00\ ^{+0.000\ 02}_{-0.000\ 47}$ in.

(c) Collar Diameter : $1.375\ 00\ ^{+0.003\ 00}_{-0.000\ 20}$ in.

(d) Distance between centres : 1.750 ± 0.015 in.

It is recommended that before converting multiple number values including statement of precision, the main values and the tolerances be expressed as limiting values in order to avoid errors. Thus the value in the above example will be expressed as

(a) 32.191 07 and 32.111 03 feet per second squared
(b) 1.800 02 and 1.799 53 in.
(c) 1.378 00 and 1.374 80 in.
(d) 1.765 and 1.735 in.

Since it is generally preferred to use the limiting values as such for workshop practice, the converted dimensional values may be left in the form of limiting values. But, if tolerances or errors of converted values in terms of new units of measurements are desired, they may be derived from the converted limiting values by simple subtraction and the results expressed accordingly.

5 CONVERSION OF VALUES FROM ONE SYSTEM TO THE OTHER

5.1 Conversion of Unqualified Single Number Values and Maximum and Minimum Single Number Values

(Categories given in clauses 4.4.1 and 4.4.2).

The rules to be followed in the conversion of given values from one set of units to another shall be as follows :

Rule i : Classify the given value and examine its significance as discussed in Section 4.

Rule ii : Rewrite the given value, modifying it, if necessary as directed under Section 4.

Rule iii : Choose an appropriate conversion factor preferably from those given in Section 3 or Appendix I and round it off to the number of decimal places required for the particular conversion. It is generally adequate to retain in the conversion factor two more significant figures than those appearing in the rewritten given number.

NOTE : *To convert values expressed in derived units it is recommended that such a conversion factor be selected as will require only one arithmetical operation; preferably multiplication. If such a factor is not readily available, it may be calculated by using the Principal Conversion Factors. This procedure will reduce the chance of avoidable error and save time in calculation.*

For example :

The value 12.2 ounce per square yard should not be converted by first multiplying by 28.34 to convert it to gramme per square yard and then dividing by 0.836 to get gramme per square metre.

According to this rule, the conversion should be done by using the conversion factor.

1 ounce per square yard = 33.906 gramme per square metre

Similarly to convert an area value given in square inches into square millimetre, multiply directly by 645.16 and not by 25.4 twice.

Rule iv : Convert the rewritten value by using the selected or calculated conversion factor carrying out the conversion to two more significant figures than in the rewritten value.

Rule v : For rounding off the converted value, decide the fineness of rounding as follows :

(a) Write down the significant part of the rewritten original value for using it as standard of comparison Call it S_o.

(b) Drop one figure at a time from the significant part of the converted value until this significant part assumes for the first time the same order of mangnitude as S_o.

(c) Drop another significant figure from S_1 and observe that the resultant value S_2 is also of the same order of magnitude as S_o.

(d) Of S_1 and S_2, choose one as S which bears the least ratio to S_o i.e. if $\frac{S_1}{S_o} \leqslant \frac{S_o}{S_2}$, choose S_1 as S

if $\frac{S_1}{S_o} > \frac{S_o}{S_2}$, choose S_2 as S

If S_1 contains only one significant figure, S_1 shall be taken to be S.

(e) The fineness of rounding should then be taken as unity in the last place retained in S.

For example, consider the conversion of 4½ + 0.001 inches to millimetres.

The rewritten original value will be 4.501 0 in
The converted value will be 114.325 40 mm.

Significant Part of Rewritten Value	Significant Part of Converted Value
45 010	11 432 540
	11 432 54Ø
	11 432 5ØØ

Then S_o is 45 010,
S_1 is 114 325,
and S_2 is 11 432,

Therefore, $\frac{S_1}{S_o} = \frac{114\ 325}{45\ 010} = 2.54$

and $\frac{S_o}{S_2} = \frac{45\ 010}{11\ 432} = 3.94$

Therefore, S_1 = 114 352 is chosen as S
The fineness of rounding is then taken to unit place in 114.325 i.e. to 0.001.

Therefore, the final converted value will be 114.325 mm.

Rule vi : Using the fineness of rounding thus determined, round off the calculated converted value and retain in the final converted value all the significant zeros and drop from it all the non-significant zeros.

NOTE : *In the case of multiple number values including statement of precision, the tolerances, or errors in terms of new units of measurement may be obtained, if desired, from the converted limiting values.*

5.2 Conversion of toleranced dimensions from inches to millimetres and vice versa to ensure interchangeability
(Category given in Clause 4.4.3)

When tolerance limits of a specified value are stated it is essential that in order to ensure interchangeability of parts made to such tolerances, careful consideration be given during conversion to the associated accuracy of the tolerances.

5.2.1 There are two methods by which the conversions can be carried out. **In method A** which is generally applicable, the rounding is effected to **the nearest rounded value** so that, on the average, the converted tolerances remain statistically identical with the original tolerances. The limits converted by this method are considered acceptable for interchangeability. **In method B**, the rounding is effected systematically **towards the interior** of the tolerance zone so that, on the average the converted tolerances are smaller than the original tolerances. This method should be employed only when, by special agreement, the original limits have to be respected absolutely.

5.2.2 *Conversion of inches to millimetres*

(a) General rules for Method A are :

i For each dimension in inches consider only its two limits, maximum and minimum.

ii Convert the corresponding two values exactly into millimetres by using the Table 1 of Appendix B.

iii Round the results obtained in this way to the nearest rounded value as indicated in the Table below, depending on the original tolerance in inches.

(b) The rules i and ii are the same for Method B and rounding is effected towards the interior of the tolerance (i.e. to the next lower value for the upper limit and to the next higher value for the lower limit.)

TABLE

Original tolerance in inches		Round off to a whole number of mm
Not less than in	and below in	
0.000 01	0.000 1	0.000 01
0.000 1	0.001	0.000 1
0.001	0.01	0.001
0.01	0.1	0.01
0.1	1	0.1

Example 1

To convert the dimension expressed in inches as 3.565 ± 0.007 the two limits are 3.558 and 3.572 in. Converting to millimetres we get 90.373 2 and 90.728 8 mm. As the converted values should be rounded to a fineness of 0.01 mm (by using rule iii of Method A) which gives the two limits in millimetres as 90.37 and 90.73.

According to Method B, the two limits would be : 90.38 and 90.72 mm.

Example 2

To convert the dimension expressed in inches as $2\frac{3}{8}$ ± 1/32 expressing it as a decimal fraction, we get 2.375 ± 0.031 in. The two limits are 2.344 and 2.406 in respectively, and when converted to millimetres, we get 59.537 6 and 61.112 4 mm respectively. As the tolerance equals 0.062 in and thus lies between 0.01 and 0.1 in, the converted values should be rounded to a fineness of 0.01 mm (by using rule iii of Method A) which gives the two limits in millimetres as 59.54 and 61.11 According to Method B, the two limits would be : 59.55 and 61.10 mm.

5.2.3 *Conversion of millimetres to inches*

The general rules for the Method A are :

i For each dimension in millimetres consider only its two limits, maximum and minimum

ii Convert the corresponding two values into inches using Table 2 of Appendix B

iii Round the results obtained in this way to the nearest rounded value as indicated in the Table given below, depending on the original tolerance in millimetres. The rules i and ii are same for Method B also but, rounding is effected towards the interior of the tolerance (i.e. to the next lower value for the upper limit and to the next higher value for the lower limit).

Original Tolerance in millimetres		Round off to a whole number of
Not less than	and below	
mm	mm	in
0.000 3	0.005	0.000 001
0.005	0.05	0.000 01
0.05	0.5	0.000 1
0.5	5	0.001
5	50	0.01

For example :

To convert the dimension expressed in millimetres as 56.65 ± 0.15, the two limits are 56.50 and 56.80 mm. Converting to inches using Table 2 of Appendix B we get 2.224 409 4 and 2 236 220 5. As the tolerance equals 0.30 mm, and thus lies between 0.05 and 0.5, the two limiting values in inches shall be rounded to a fineness of 0.000 1 (using Rule iii, of Method A). The converted values in inches are :- 2.2244 and 2.236 2. According to Method B, the two limits would be 2.224 5 and 2.236 1 in.

APPENDIX A

Derived Factors

Length

1 mile	=	1 609.344	metres
1 international nautical mile	=	1.852	kilometres

Area

1 acre	=	0.404 686	hectares
1 square mile	=	2.589 99	square kilometres
	=	258.999	hectares

Volume, Capacity

1 UK gallon or Imperial gallon	=	4.546 09	litres*
1 US gallon	=	3.785 43	litres*
1 litre	=	0 220 UK	gallon
1 UK fluid ounce	=	28.413 0	cubic centimetres
1 UK pint	=	0.568 261	cubic decimetre
1 UK minim	=	0.059 193 8	cubic centimetre
1 UK bushel	=	0.036 368 7	cubic metre
1 US bushel	=	0.035 239 3	cubic metre
1 US liquid pint	=	0.473 179	cubic decimetre
1 US dry pint	=	5.506 14 x 10^{-4}	cubic metre

Velocity

1 mile per hour	=	0.477 04	metre per second
1 UK knot	=	0.514 772	metre per second

Mass

1 grain	=	0.064 798.9	gramme
1 apothecaries' ounce or troy ounce	=	31.103 5	grammes
1 UK ton	=	1.016 05	tonnes
1 US ton	=	0.907 184	tonnes

Force

1 kilogramme-force	=	9.806 65	newtons
1 pound-force	=	32.174 0	poundals
	=	0.453 592	kilogramme-force

** Litre which equals one decimetre cube is as defined by the 12th CGPM*

Appendix A (Contd.)

Pressure, Stress

1 pound-force per square inch	=	6 894.76	newtons per square metre
1 UK ton-force per square inch	=	157.488	kilogramme-force per square centimetre
1 in Hg (conventional)	=	3.386 39	kilonewtons per square metre
	=	33.863 9	millibar

Energy (Heat, Work)

1 joule	=	0.737 562	foot pound-force
	=	$9.478\ 17 \times 10^{-4}$	British Thermal Units
1 British Thermal Unit	=	2.930 71	kilowatt hours
		1.055 06	kilojoules

Power

1 foot pound-force per second	=	1.355 82	watts
1 horse power	=	745.70	watts
	=	76.040 2	kilogramme-force metres per second

APPENDIX B

B-1. Tables for Conversion from Inches into Millimetres*

B-1.1 Fractions of an inch

in		mm	in		mm
1/64	0.015 625	0.396 875	33/64	0.515 625	13.096 875
1/32	0.031 250	0.793 750	17/32	0.531 250	13.493 750
3/64	0.046 875	1.190 625	35/64	3.546 875	13.890 625
1/16	0.062 500	1.587 500	9/16	0.562 500	14.287 500
5/64	0.078 125	1.984 375	37/64	0.578 125	14.684 375
3/32	0.093 750	2.381 250	19/32	0.593 750	15.081 250
7/64	0.109 375	2.778 125	39/64	0.609 375	15.478 125
1/8	0.125 000	3.175 000	5/8	0.625 000	15.875 000
9/64	0.140 625	3.571 875	41/64	0.640 625	16.271 875
5/32	0.156 250	3.968 750	21/32	0.656 250	16.668 750
11/64	0.171 875	4.365 625	43/64	0.671 875	17.065 625
3/16	0.187 500	4.762 500	11/16	0.687 500	17 462 500
13/64	0.203 125	5.159 375	45/64	0.703 125	17 859 375
7/32	0.218 750	5.556 250	23/32	0.718 750	18 256 250
15/64	0.234 375	5.953 125	47/64	0.734 375	18.653 125
1/4	0.250 000	6.350 000	3/4	0.750 000	19.050 000
17/64	0.265 625	6.746 875	49/64	0.765 625	19.446 875
9/32	2.281 250	7.143 750	25/32	0.781 250	19.843 750
19/64	0.296 875	7.540 625	51/64	0.796 875	20.240 625
5/16	0.312 500	7.937 500	13/16	0.812 500	20.637 500
21/64	0.328 125	8.334 375	53/64	0.828 125	21.034 375
11/32	0.343 750	8.371 250	27/32	0.843 750	21.431 250
23/64	0.359 375	9.128 125	55/64	0.859 375	21.825 125
3/8	0.375 000	9.525 000	7/8	0.875 000	28.225 000
25/64	0.390 625	9.921 875	57/64	0.890 625	22 621 875
13/32	0.406 250	10.318 750	29/32	0.906 250	23.018 750
27/64	0.421 875	10.715 625	59/64	0.921 875	23.415 625
7/16	0.437 500	11.112 500	15/16	0.937 500	23.812 500
29/64	0.453 125	11.509 375	61/64	0.953 125	24.209 375
15/32	0.468 750	11.906 250	31/32	0.968 750	24.606 250
31/64	0.484 375	12.303 125	63/64	0.984 375	25.003 125
1/2	0.500 000	12.700 000	1	1.000 000	25.400 000

* *On the basis of the conversion factor 1 in = 25.4 mm*

(All the values in these tables are exact).

APPENDIX B (Contd.)

B-1.2 Decimals of an inch

in	mm
0.001	0.0254
0.002	0.0508
0.003	0.0762
0.004	0.1016
0.005	0.1270
0.006	0.1524
0.007	0.1778
0.008	0.2032
0.009	0.2286

in	mm
0.01	0.254
0.02	0.508
0.03	0.762
0.04	1.016
0.05	1.270
0.06	1.524
0.07	1.778
0.08	2.032
0.09	2.286

in	mm
0.1	2.54
0.2	5.08
0.3	7.62
0.4	10.16
0.5	12.70
0.6	15.24
0.7	17.78
0.8	20.32
0.9	22.86

B-1.3 Inches

in	mm	in	mm
1	25.4	51	1295.4
2	50.8	52	1320.8
3	76.2	53	1346.2
4	101.6	54	1371.6
5	127.0	55	1397.0
6	152.4	56	1422.4
7	177.8	57	1447.8
8	203.2	58	1473.2
9	228.6	59	1498.6
10	254.0	60	1524.0
11	279.4	61	1549.4
12	304.8	62	1574.8
13	330.2	63	1600.2
14	355.6	64	1625.6
15	381.0	65	1651.0
16	406.4	66	1676.4
17	431.8	67	1701.8
18	457.2	68	1727.2
19	482.6	69	1752.6
20	508.0	70	1778.0
21	533.4	71	1803.4
22	558.8	72	1828.8
23	584.2	73	1854.2
24	609.6	74	1879.6
25	635.0	75	1905.0
26	660.4	76	1930.4
27	685.8	77	1955.8
28	711.2	78	1981.2
29	736.6	79	2006.6
30	762.0	80	2032.0
31	787.4	81	2057.4
32	812.8	82	2082.8
33	838.2	83	2108.2
34	863.6	84	2133.6
35	889.0	85	2159.0
36	914.4	86	2184.4
37	939.8	87	2209.8
38	965.2	88	2235.2
39	990.6	89	2260.6
40	1016.0	90	2286.0
41	1041.4	91	2311.4
42	1066.8	92	2336.8
43	1092.2	93	2362.2
44	1117.6	94	2387.6
45	1143.0	95	2413.0
46	1168.4	96	2438.4
47	1193.8	97	2463.8
48	1219.2	98	2489.2
49	1244.6	99	2514.6
50	1270.0	100	2540.0

APPENDIX B (Contd.)

B-2 Tables for Conversion from Millimetres into Inches*

B-2.1 Decimals of a Millimetre

mm	in
0.001	0.000 039 4
0.002	0.000 078 7
0.003	0.000 118 1
0.004	0.000 157 5
0.005	0.000 196 9
0.006	0.000 236 2
0.007	0.000 275 6
0.008	0.000 315 0
0.009	0.000 354 3

mm	in
0.01	0.000 393 7
0.02	0.000 787 4
0.03	0.001 181 1
0.04	0.001 574 8
0.05	0.001 968 5
0.06	0.002 362 2
0.07	0.002 755 9
0.08	0.003 149 6
0.09	0.003 543 3

mm	in
0.1	0.003 937 0
0.2	0.007 874 0
0.3	0.011 811 0
0.4	0.015 748 0
0.5	0.019 685 0
0.6	0.023 622 0
0.7	0.027 559 1
0.8	0.031 496 1
0.9	0.035 433 1

**On the basis of the conversion factor 1 mm = 1/25.4 in. (The inch values in these tables are rounded to the nearest value in the 7th decimal place.)*

B-2.2 Millimetres

mm	in	mm	in
1	0.039 370 1	51	2.007 874 0
2	0.078 740 2	52	2.047 244 1
3	0.118 110 2	53	2.086 614 2
4	0.157 480 3	54	2.125 984 2
5	0.196 850 4	55	2.165 354 3
6	0.236 220 5	56	2.204 724 4
7	0.275 590 6	57	2.244 094 5
8	0.314 960 6	58	2.283 464 6
9	0.354 330 7	59	2.322 834 6
10	0.393 700 8	60	2.362 204 7
11	0.433 070 9	61	2.401 574 8
12	0.472 440 9	62	2.440 944 9
13	0.511 811 0	63	2.480 315 0
14	0.551 181 1	64	2.519 685 0
15	0.590 551 2	65	2.559 055 1
16	0.629 921 3	66	2.598 425 2
17	0.669 291 3	67	2.637 795 3
18	0.708 661 4	68	2.677 165 4
19	0.748 031 5	69	2.716 535 4
20	0.787 401 6	70	2.755 905 5
21	0.826 771 7	71	2.795 275 6
22	0.866 141 7	72	2.834 645 7
23	0.905 511 8	73	2.874 015 7
24	0.944 881 9	74	2.913 385 8
25	0.984 252 0	75	2.952 755 9
26	1.023 622 0	76	2.992 126 0
27	1.062 992 1	77	3.031 496 1
28	1.102 362 2	78	3.070 866 1
29	1.141 732 3	79	3.110 236 2
30	1.181 102 4	80	3.149 606 3
31	1.220 472 4	81	3.188 976 4
32	1.259 842 5	82	3.228 346 5
33	1.299 212 6	83	3.267 716 5
34	1.338 582 7	84	3.307 086 6
35	1.377 952 8	85	3.346 456 7
36	1.417 322 8	86	3.385 826 8
37	1.456 692 9	87	3.425 196 8
38	1.496 063 0	88	3.464 566 9
39	1.535 433 1	89	3.503 937 0
40	1.574 803 1	90	3.543 307 1
41	1.614 173 2	91	3.582 677 2
42	1.653 543 3	92	3.622 047 2
43	1.692 913 4	93	3.661 417 3
44	1.732 283 5	94	3.700 787 4
45	1.771 653 5	95	3.740 157 5
46	1.811 023 6	96	3.779 527 6
47	1.850 393 7	97	3.818 897 6
48	1.889 763 8	98	3.858 267 7
49	1.929 133 9	99	3.897 637 8
50	1.968 503 9	100	3.937 007 9

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