

















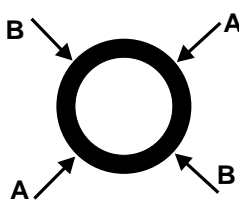
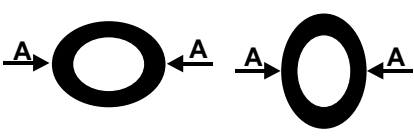






**TABLE VII**

**TOLERANCES ON DIAMETER (INSIDE & OUTSIDE) OF EXTRUDED ROUND TUBES**

SPECIFIED DIAMETER (mm)		Tolerances - (mm +/-)	
		Allowable deviation of mean diameter from specified diameter	Allowable deviation of diameter at any point from specified diameter (ovality)
			
Over	Upto and Including	Difference between 1/2 (AA+BB) and specified diameter	Difference between AA and specified diameter
12	22	0.25	0.50
22	36	0.30	0.60
36	45	0.40	0.80
45	50	0.45	0.90
50	63	0.50	1.00
63	80	0.60	1.30
80	150	1% of diameter	2.2% of diameter

**TABLE VIII**

**TOLERANCES ON WALL THICKNESS OF EXTRUDED ROUND TUBES**


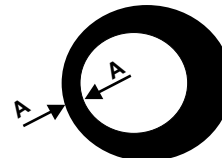
SPECIFIED WALL THICKNESS (mm)		Tolerances - (mm +/-)		
		Allowable deviation of mean Wall Thickness from specified Wall Thickness	Allowable deviation of Wall Thickness at any point from mean Wall Thickness (Eccentricity)	
				
Over	Upto and Including	Difference between 1/2 (AA+BB) & specified Wall Thickness	Difference between AA & mean wall thickness as extruded AA - 1/2 (AA+BB)	
		Outside diameter - mm	Plus & Minus 10% of mean wall thickness	
		Under 30    30 - 65    65 - 100	max : +/- 1.5 min : +/- 0.25	
1	1.3	0.20    0.23    0.25		
1.3	1.6	0.30    0.30    0.33		
1.6	2	0.35    0.35    0.40		
2	3	0.45    0.50    0.55		
3	4	0.60    0.60    0.65		
4	5	0.80    0.80    0.85		
5	6	0.85    0.85    0.90		



TABLE IX

TOLERANCES FOR FLATNESS

SOLIDS		Minimum Thickness of metal forming the surface mm	HOLLOWS	
Surface Width mm.	Tolerances - mm		Tolerances - mm	
			max. allowable deviation (D)	
Upto 25	+/-0.18	Upto 4.5 4.5 & over	Width upto 25mm or any 25 mm increment of wider Surface	Width over 25mm
Over 25 Upto & including 38	0.25			
Over 38 Upto & including 50	0.30		+/-0.20	+/-0.008xW
Over 50	0.30 Plus 0.13 per each 25 mm of Width		+/-0.15	+/-0.006xW

TABLE X  
ANGULAR TOLERANCES FOR REGULAR SECTIONS

Minimum specified leg Thickness mm.	Allowable deviation from specified Angle
Upto and including 5	+/- 2°
Over 5 upto and including 19	+/- 1.5°
Over 19	+/- 1°

NOTE : 1. Angles should be measured at the extremities of the sections.  
2. Not applicable to shapes.

TABLE XI

TOLERANCES ON TWIST

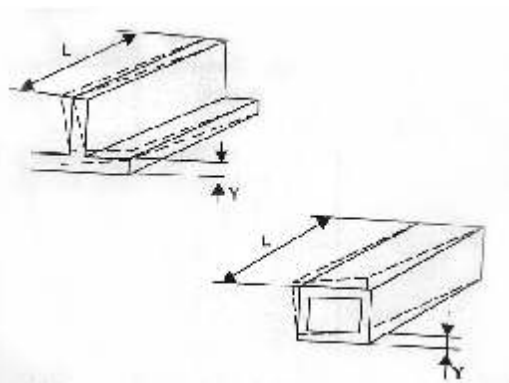
PRODUCT	Specified Width (Bar & Tubes) Circumscribing Circle diameter (Shapes) mm	Specified Thickness (Rectangular Tubes) Minimum Thickness (shapes) mm	Tolerances - Degree (+) & (-)	
			Allowable deviation from straightness	
				
			In any metre or less of length	In total length of piece
BAR	Upto 38	All	$\pm 2^{\circ}$	$2^{\circ}$ x length m $6^{\circ}$ max. In full length
	38 & over	All	$1\frac{1}{2}^{\circ}$	$1\frac{1}{2}^{\circ}$ x length m $5^{\circ}$ max. In full length
SHAPES	Upto 38	All	$2^{\circ}$	$2^{\circ}$ x length m $6^{\circ}$ max. In full length
	38 & over	All	$1\frac{1}{2}^{\circ}$	$1\frac{1}{2}^{\circ}$ x length m $5^{\circ}$ max. In full length
HOLLOWS (other than Round Tubes)	Upto 38	All	$2^{\circ}$	$2^{\circ}$ x length m $6^{\circ}$ max. In full length
	38 & over	All	$1\frac{1}{2}^{\circ}$	$1\frac{1}{2}^{\circ}$ x length m $5^{\circ}$ max. In full length



TABLE XII

TOLERANCES FOR STRAIGHTNESS (Rods, Bars, Shapes & Tubes)

PRODUCT	Specified DIA. (Rod) Specified Width (Bar) Circumscribing Circle Diameter (shapes)  Specified DIA. (Tubes) mm.	Specified Thickness (Rectangles) Minimum Thickness (shapes)  Specified Thickness (Tubes) mm.	Tolerances -mm	
			Allowable deviation (D) from straightness	
			In one metre length	In total length of piece
Rod & Square, Hexagonal and Octagonal Bar	All		1.7	1.7 x length m
Rectangular Bar	Upto 38	Upto 2.35	4.0	4 x length m
	38 & over	2.35 and over	1.7	1.7 x length m
Shapes	Upto 38	Upto 2.35	4.0	4 x length m
	38 & over	2.35 and over	1.7	1.7 x length m
Tubes	All	Upto 2.35	4.0	4 x length m
		2.35 and over	1.7	1.7 x length m

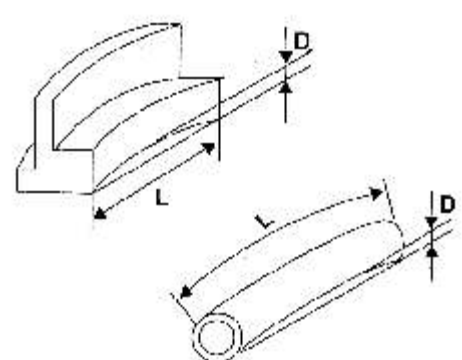


TABLE XIII  
CONVERSION OF SWG TO INCHES & mm.

SWG	Inches	mm	SWG	Inches	mm	SWG	Inches	mm
6	0.192	4.877	12	0.104	2.642	18	0.048	1.219
7	0.176	4.470	13	0.092	2.337	19	0.040	1.016
8	0.160	4.064	14	0.080	2.032	20	0.036	0.914
9	0.144	3.658	15	0.072	1.829	21	0.032	0.812
10	0.128	3.251	16	0.064	1.626	22	0.028	0.711
11	0.116	2.946	17	0.056	1.422	23	0.024	0.610