

TYPE	DIMENSIONAL YARDSTICKS	FIGURE
SHEETS	<p>Standard Size: 14" x 48" / 356.00 mm x 1220.00 mm</p> <p>Length : 48" / 1220.00 mm</p> <p>Width : 14" / 356.00 mm</p> <p>Thickness : 6.00 mm - 0.20 mm</p>	
SHEETS CUT LENGTHS	<p>Customized as per the requirements</p> <p>Length : Upto 2000.00 mm</p> <p>Width : Upto 610.00 mm</p> <p>Thickness : 6.00 mm - 0.20 mm</p>	
COILS	<p>Standard Size : 14" / 356.00 mm</p> <p>Length : Running</p> <p>Width : 14" / 356.00 mm</p> <p>Thickness : 2.30 mm - 0.040 mm</p>	
COILS STRIPS	<p>Customized as per the requirements</p> <p>Length : Running</p> <p>Width : 6.00 mm - 400.00 mm</p> <p>Thickness : 2.30 mm - 0.040 mm</p>	
CIRCLES	<p>Customized as per the requirement</p> <p>Diameter : Upto 26" / 660.00 mm</p> <p>Thickness : 2.50 mm - 0.50 mm</p>	
PHARMAS	<p>Customized as per the requirement in different shapes for eg. Stars, Oval, etc. (Die is to be provided by buyer)</p>	

# COMPARISON (GAUGES VS MILIMETRES VS THOUSANDS)



GAUGE	M.M.	THOUS	GAUGE	M.M.	THOUS
1 swg	7.62	300.00	26 swg	0.45	17.72
2 swg	7.01	275.98	27 swg	0.40	15.75
3 swg	6.40	251.97	28 swg	0.37	14.57
4 swg	5.89	231.89	29 swg	0.34	13.39
5 swg	5.39	212.20	30 swg	0.31	12.20
6 swg	4.88	192.13	31 swg	0.30	11.81
7 swg	4.47	175.98	32 swg	0.27	10.63
8 swg	4.06	159.84	33 swg	0.25	9.84
9 swg	3.66	144.09	34 swg	0.23	9.06
10 swg	3.25	127.95	35 swg	0.20	7.87
11 swg	2.95	116.14	36 swg	0.19	7.48
12 swg	2.64	103.94	37 swg	0.17	6.69
13 swg	2.34	92.13	38 swg	0.15	5.91
14 swg	2.03	79.92	39 swg	0.13	5.12
15 swg	1.83	72.05	40 swg	0.12	4.72
16 swg	1.63	64.17	41 swg	0.11	4.33
17 swg	1.42	55.91	42 swg	0.10	3.94
18 swg	1.22	48.03	43 swg	0.09	3.54
19 swg	1.01	39.76	44 swg	0.08	3.15
20 swg	0.91	35.83	45 swg	0.07	2.76
21 swg	0.81	31.89	46 swg	0.06	2.36
22 swg	0.71	27.95	47 swg	0.05	1.97
23 swg	0.60	23.62	48 swg	0.04	1.57
24 swg	0.56	22.05	49 swg	0.03	1.18
25 swg	0.50	19.69	50 swg	0.025	0.98

### IMPORTANT MEASUREMENTS

1 metre	=	39.37 inches	1 foot	=	12 inches
1 feet	=	304.80 mm	1 inches	=	25.40 mm
1 inches	=	1000 thous	1 mm	=	39.37 thous

# WEIGHT CHART



THICKNESS			WEIGHT PER SHEET			THICKNESS			WEIGHT PER SHEET		
GAUGE	M.M.	Thous	Br 14*48	Cu 14*48	PB 14*48	GAUGE	M.M.	Thous	Br 14*48	Cu 14*48	PB 14*48
1 swg	7.62	300.00	29.590	30.450	28.730	26 swg	0.45	17.72	1.690	1.850	1.660
2 swg	7.01	275.98	27.140	28.000	26.510	27 swg	0.40	15.75	1.540	1.620	1.480
3 swg	6.40	251.97	24.850	25.580	24.200	28 swg	0.37	14.57	1.390	1.470	1.370
4 swg	5.89	231.89	22.870	23.530	22.270	29 swg	0.34	13.39	1.270	1.340	1.290
5 swg	5.39	212.20	20.930	21.530	20.380	30 swg	0.31	12.20	1.160	1.210	1.140
6 swg	4.88	192.13	18.950	19.500	18.450	31 swg	0.30	11.81	1.120	1.150	1.110
7swg	4.47	175.98	17.360	17.860	16.900	32 swg	0.27	10.63	1.010	1.040	1.000
8 swg	4.06	159.84	15.150	15.350	14.760	33 swg	0.25	9.84	0.940	0.960	0.920
9 swg	3.67	144.33	13.820	14.700	13.880	34 swg	0.23	9.06	0.860	0.890	0.850
10 swg	3.20	125.98	12.050	12.380	12.000	35 swg	0.20	7.87	0.790	0.810	0.740
11 swg	2.95	116.14	10.915	11.420	10.890	36 swg	0.19	7.48	0.710	0.720	0.700
12 swg	2.64	103.94	9.790	10.220	9.750	37swg	0.17	6.69	0.630	0.640	0.630
13 swg	2.34	92.13	8.658	9.050	8.640	38 swg	0.15	5.91	0.560	0.570	0.550
14 swg	2.03	79.92	7.530	7.850	7.500	39 swg	0.13	5.12	0.490	0.500	0.480
15 swg	1.83	72.05	6.770	7.070	6.750	40 swg	0.12	4.72	0.450	0.460	0.440
16 swg	1.63	64.17	6.020	6.310	5.980	41 swg	0.11	4.33	0.400	0.410	0.400
17 swg	1.42	55.91	5.250	5.490	5.240	42 swg	0.10	3.94	0.370	0.380	0.370
18 swg	1.22	48.03	4.520	4.720	4.500	43 swg	0.09	3.54	0.330	0.340	0.330
19 swg	1.01	39.76	3.760	3.940	3.730	44 swg	0.08	3.15	0.310	0.320	0.300
20 swg	0.91	35.83	3.390	3.520	3.360	45 swg	0.07	2.76	0.260	0.270	0.260
21 swg	0.81	31.89	3.010	3.130	3.000	46 swg	0.06	2.36	0.220	0.230	0.220
22 swg	0.71	27.95	2.630	2.740	2.620	47 swg	0.05	1.97	0.180	0.190	0.185
23 swg	0.60	23.62	2.260	2.360	2.220	48 swg	0.04	1.57	0.144	0.152	0.148
24 swg	0.56	22.05	2.070	2.160	2.070	49 swg	0.03	1.18	0.108	0.114	0.111
25 swg	0.50	19.69	1.880	1.970	1.850	50 swg	0.025	0.98	0.090	0.095	0.092

**NOTE:** The above given weights are approximate weights.

ITEM	DENSITY (Per cm cube)	WEIGHT CALCULATION FORMULAE
COPPER (Cu.)	8.94 gm/cm <sup>3</sup>	Weight = L x W x T x D / 1000000
TIN (Sn.)	7.365 gm/cm <sup>3</sup>	(L : Length ; W : Width ; T : Thickness ; D : Density
ZINC (Zn.)	7.14 gm/cm <sup>3</sup>	Weight in kg, L, W & T in mm & D in gm/cm <sup>3</sup> )

# PRODUCT RANGE



## RELEVANT INTERNATIONAL STANDARDS - BRASS

GRADE (ALLOY)	INTERNATIONAL (ISO)	GERMAN (DIN)	U.S.A. (ISTM)	U.K. (BS)	JAPAN (JIS)
95-5	CuZn5	CuZn5	C21000	CZ 125	C2100
90-10	CuZn10	CuZn10	C22000	CZ 101	C2200
85-15	CuZn15	CuZn15	C23000	CZ 102	C2300
80-20	CuZn20	CuZn20	C24000	CZ 103	C2400
70-30	CuZn30	CuZn30	C26000	CZ 106	C2600
65-35	CuZn36	CuZn36	C26800	CZ 107	C2680
63-37	CuZn37	CuZn37	C27200	CZ 108	C2720
60-40	CuZn40	CuZn40	C28000	CZ 109	C2801
F.C.B.	CuZn39Pb2	CuZn39Pb2	-	CZ 120	C3713

## RELEVANT INTERNATIONAL STANDARDS - COPPER

GRADE (ALLOY)	INTERNATIONAL (ISO)	GERMAN (DIN)	U.S.A. (ISTM)	U.K. (BS)	JAPAN (JIS)
E.T.P.	Cu-E.T.P.	E-Cu	C11000	C 101	C1100
OxLP	Cu-OF	SE-Cu	C10300	CW 023A	C1030
D.L.P.	Cu-DLP	SW	C12000	-	C1201
D.H.P.	Cu-DHP	SF	C12200	C 106	C1220
CuZn0.5	-	-	-	-	-
CuSn0.15	C14410	-	-	-	-

## RELEVANT INTERNATIONAL STANDARDS - PHOSPHORUS BRONZE (PB)

GRADE (ALLOY)	INTERNATIONAL (ISO)	GERMAN (DIN)	U.S.A. (ISTM)	U.K. (BS)	JAPAN (JIS)
Grade-I	CuSn4	CuSn4	C50900	PB 101	C5111
Grade-II	CuSn5	CuSn5	C51000	PB 102	C5102
Grade-III	CuSn6	CuSn6	C51900	PB 103	C5191
Grade-IV	CuSn8	CuSn8	C52100	-	C5210

# CHEMICAL COMPOSITION & MECHANICAL PROPERTIES



## BRASS (BR.)

GRADE	COMPOSITION IN %	TEMPER	TENSILE STRENGTH N/MM SQ.	ELONGATION % ON 50MM G.L.	VICKERS HARDNESS (VPN)
<b>95-5 Cap Copper</b>	<b>Copper 95 Zinc 5</b>	<b>0</b>	-	-	<b>75 Max</b>
<b>90-10 Guilding Metal</b>	<b>Copper 90 Zinc 10</b>	<b>O</b>	<b>245 Min</b>	<b>35 Min</b>	<b>75 Max</b>
		<b>HB</b>	<b>310 Min</b>	<b>7 Min</b>	<b>95 Min</b>
		<b>HD</b>	<b>350 Min</b>	<b>3 Min</b>	<b>110 Min</b>
<b>85-15 Guilding Metal</b>	<b>Copper 85 Zinc 15</b>	<b>O</b>	<b>245 Min</b>	<b>35 Min</b>	<b>75 Max</b>
		<b>HB</b>	<b>325 Min</b>	<b>7 Min</b>	<b>95 Min</b>
		<b>HD</b>	<b>370 Min</b>	<b>3 Min</b>	<b>110 Min</b>
<b>80-20 Brass</b>	<b>Copper 80 Zinc 20</b>	<b>O</b>	<b>265 Min</b>	<b>40 Min</b>	<b>80 Max</b>
		<b>HB</b>	<b>340 Min</b>	<b>10 Min</b>	<b>95 Min</b>
		<b>HD</b>	<b>400 Min</b>	<b>5 Min</b>	<b>120 Min</b>
<b>70-30 Cartridge Brass</b>	<b>Copper 70 Zinc 30</b>	<b>O</b>	<b>280 Min</b>	<b>50 Min</b>	<b>80 Max</b>
		<b>HA</b>	<b>325 Min</b>	<b>35 Min</b>	<b>75 Min</b>
		<b>HB</b>	<b>350 Min</b>	<b>20 Min</b>	<b>100 Min</b>
		<b>HD</b>	<b>415 Min</b>	<b>5 Min</b>	<b>125 Min</b>
		<b>HE</b>	<b>525 Min</b>	-	<b>165 Min</b>
<b>65-35 Brass</b>	<b>Copper 65 Zinc 35</b>	<b>O</b>	<b>280 Min</b>	<b>45 Min</b>	<b>80 Max</b>
		<b>HA</b>	<b>340 Min</b>	<b>35 Min</b>	<b>75 Min</b>
		<b>HB</b>	<b>385 Min</b>	<b>20 Min</b>	<b>110 Min</b>
		<b>HD</b>	<b>460 Min</b>	<b>5 Min</b>	<b>135 Min</b>
		<b>HE</b>	<b>525 Min</b>	-	<b>165 Min</b>
		<b>HS</b>	<b>670 Min</b>	-	<b>185 Min</b>
<b>63-37 Brass</b>	<b>Copper 63 Zinc 37</b>	<b>O</b>	<b>280 Min</b>	<b>40 Min</b>	<b>80 Max</b>
		<b>HA</b>	<b>340 Min</b>	<b>30 Min</b>	<b>75 Min</b>
		<b>HB</b>	<b>385 Min</b>	<b>15 Min</b>	<b>110 Min</b>
		<b>HD</b>	<b>460 Min</b>	<b>5 Min</b>	<b>135 Min</b>
		<b>HE</b>	<b>525 Min</b>	-	<b>165 Min</b>
		<b>HS</b>	<b>670 Min</b>	-	<b>185 Min</b>
<b>60-40 Brass</b>	<b>Copper 60 Zinc 40</b>	<b>O</b>	<b>275 Min</b>	<b>30 Min</b>	<b>85 Max</b>
		<b>HB</b>	<b>420 Min</b>	<b>12 Min</b>	<b>100 Min</b>
		<b>HD</b>	<b>490 Min</b>	<b>5 Min</b>	<b>125 Min</b>
		<b>HE</b>	<b>525 Min</b>	-	<b>165 Min</b>
<b>LEADED BRASS Free Cutting Brass</b>	<b>Copper 58-60 Pb 1.5 - 2.5 Total Imp 0.3 Max Zinc Remaining</b>	<b>HB</b>	<b>375 Min</b>	<b>10 Min</b>	<b>110 - 140</b>
		<b>HD</b>	<b>510 Min</b>	<b>5 Min</b>	<b>140 - 165</b>
		<b>HE</b>	<b>570 Min</b>	<b>3 Min</b>	<b>165 - 190</b>

### TERMINOLOGY

<b>O</b>	Soft / Annealed	<b>HD</b>	Hard
<b>HA</b>	Quarter Hard / 1/4 Hard	<b>HE</b>	Extra Hard
<b>HB</b>	Half Hard / 1/2 Hard	<b>HS</b>	Spring Hard

# CHEMICAL COMPOSITION & MECHANICAL PROPERTIES



## COPPER (CU.)

GRADE	COMPOSITION IN %	TEMPER	TENSILE STRENGTH N/MM SQ.	ELONGATION % ON 50MM G.L.	VICKERS HARDNESS (VPN)
Electrolytic Tough Pitch HC Copper (ETP)	Cu 99.90 Min	O	210 Min	35 Min	55 Max
	Pb 0.005 Max	HA	210 Min	35 Min	65 Max
	Bi 0.001 Max	HB	240 Min	10 Min	70 - 95
	O2 0.060 Max	HD	290 Min	-	90 Min
Phosphorus Deoxidised Copper (DONA) (DHP)	Cu. 99.85 Min	O	210 Min	35 Min	55 Max
	P 0.013-0.050	HA	210 Min	35 Min	65 Max
		HB	240 Min	10 Min	70 - 95
		HD	290 Min	-	90 Min

## PHOSPHORUS BRONZE (PB)

GRADE	COMPOSITION IN %	TEMPER	TENSILE STRENGTH N/MM SQ.	ELONGATION % ON 50MM G.L.	VICKERS HARDNESS (VPN)
P.B. - I Grade-I	Tin : 3.5 - 4.5	O	295 Min	40 Min	80 Max
	Phosphorus : .02 - .40	HA	340 Min	30 Min	100 Min
	Lead : 0.02 Max	HB	430 Min	8 Min	150 Min
	Zinc : 0.30 Max	HD	510 Min	4 Min	175 Min
	Impurities : 0.50	HE	620 Min	-	180 Min
	Copper : Remaining	HS	650 Min	-	200 Min
P.B. - II Grade-II	Tin : 4.5 - 5.5	O	310 Min	45 Min	85 Max
	Phosphorus : .02 - .40	HA	350 Min	35 Min	110 Min
	Lead : 0.02 Max	HB	495 Min	10 Min	160 Min
	Zinc : 0.30 Max	HD	570 Min	4 Min	180 Min
	Impurities : 0.50	HE	645 Min	-	200 Min
	Copper : Remaining	HS	-	-	230 Max
P.B. - III Grade-III	Tin : 5.5 - 6.5	O	340 Min	50 Min	90 Max
	Phosphorus : .02 - .40	HA	385 Min	40 Min	115 Min
	Lead : 0.02 Max	HB	525 Min	12 Min	170 Min
	Zinc : 0.30 Max	HD	620 Min	6 Min	200 Min
	Impurities : 0.50	HE	695 Min	-	215 Min
	Copper : Remaining	HS	-	-	240 Max
P.B. - IV Grade-IV	Tin : 6.5 - 8.5	O	345 Min	50 Min	100 Max
	Phosphorus : .02 - .40	HA	405 Min	40 Min	125 Min
	Lead : 0.02 Max	HB	475 Min	15 Min	175 Min
	Zinc : 0.30 Max	HD	585 Min	5 Min	200 Min
	Impurities : 0.50	HE	670 Min	-	220 Min
	Copper : Remaining	HS	720 Min	-	240 Min

### TERMINOLOGY

O	Soft / Annealed	HD	Hard
HA	Quarter Hard / 1/4 Hard	HE	Extra Hard
HB	Half Hard / 1/2 Hard	HS	Spring Hard