

LYSAGHT REFEREE

A HANDBOOK OF
USEFUL INFORMATION

21ST EDITION

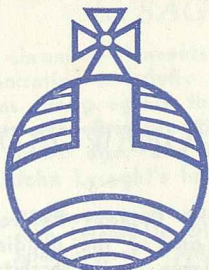


ORB
TRADE MARK

With the Compliments of
JOHN LYSAGHT (AUSTRALIA) LIMITED

Th. Dumbrell

LYSAGHT



ORB
TRADE MARK

REFEREE

TWENTY-FIRST EDITION

(FIRST IMPRESSION — 1961)

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FOREWORD

For many years the Lysaght Referee has enjoyed the reputation of being one of the handiest and most useful reference books available to the architect, builder, farmer, plumber, student, and country storekeeper.

It is with special pride that John Lysaght (Australia) Limited presents this completely revised and up-to-date twenty-first edition.

Compiled by an expert staff and from recognised authoritative sources, the user will find it a mine of practical information, the greatest care having been taken throughout to ensure the accuracy of the data and tables supplied. At the same time, no responsibility can be accepted for any errors that may have escaped the attention of the editors, nor is any originality claimed for any information contained in its pages that may be readily obtainable elsewhere. The Company will be glad to receive suggestions for inclusion in later editions.

Each copy is, of course, issued entirely without cost and with the compliments of the Company.

JOHN LYSAGHT (Australia) LIMITED

50 YOUNG STREET, SYDNEY

March, 1961

LYSAGHT — 1857-1961

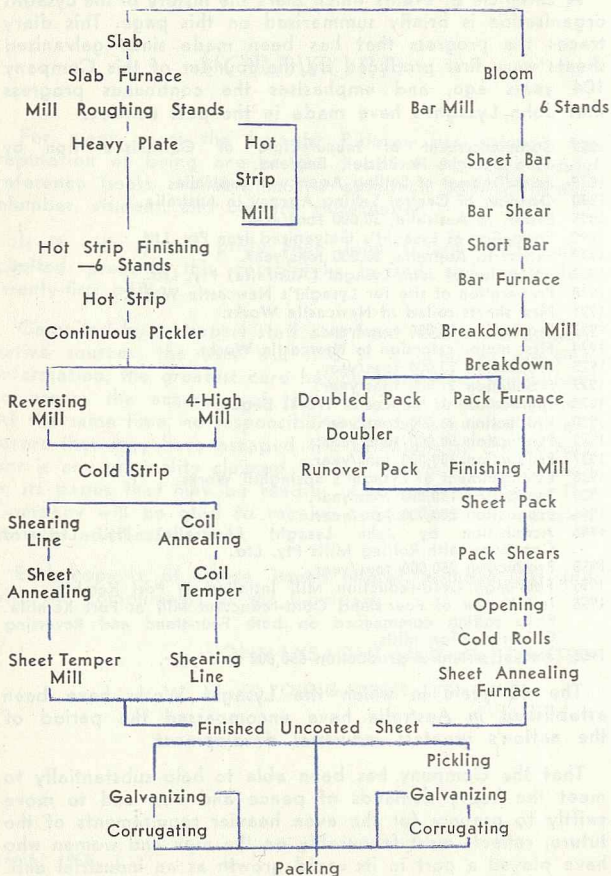
A chronicle of events which mark the history of the Lysaght organisation is briefly summarised on this page. This diary traces the progress that has been made since galvanized sheets were first produced by the founder of this Company 104 years ago, and emphasises the continuous progress that John Lysaght's have made in the past century.

- 1857 Commencement of manufacture of Galvanized Iron by John Lysaght in Bristol, England.
- 1879 Establishment of Selling Agency in Australia.
- 1880 Opening of Central Selling Agency in Australia.
- 1895 Export to Australia, 30,000 tons/year.
- 1899 Formation of Lysaght's Galvanized Iron Pty. Ltd.
- 1913 Export to Australia, 85,000 tons/year.
- 1917 Formation of John Lysaght (Australia) Pty. Ltd.
- 1918 Preparation of site for Lysaght's Newcastle Works.
- 1921 First sheets rolled at Newcastle Works.
- 1923 Production 13,000 tons/year.
- 1924 First major extension to Newcastle Works.
- 1925 Production 20,000 tons/year.
- 1927 Production 27,000 tons/year.
- 1928 Duplication of Newcastle Works began.
- 1930 Production 36,000 tons/year.
- 1932 Production 58,000 tons/year.
- 1937 Production 100,000 tons/year.
- 1938 Establishment of Lysaght's Springhill Works.
- 1939 Production 130,000 tons/year.
- 1941 Production 200,000 tons/year.
- 1946 Acquisition by John Lysaght (Australia) Pty. Ltd. of Commonwealth Rolling Mills Pty. Ltd.
- 1950 Production 250,000 tons/year.
- 1951 Four-high Cold-reduction Mill installed at Port Kembla.
- 1955 Installation of Four stand Cold-reduction Mill at Port Kembla. Strip rolling commenced on both Four-stand and Reversing Cold-reduction Mills.
- 1956 Annual potential production 650,000 tons/year.

The 40 years in which the Lysaght Works have been established in Australia have encompassed the period of the nation's greatest industrial development.

That the Company has been able to help substantially to meet the heavy demands of peace and war, and to move swiftly to prepare for the even heavier requirements of the future, reflects most favourably on the men and women who have played a part in its rapid growth as an industrial unit.

PRODUCTION OF STEEL SHEET FLOW DIAGRAM



GALVANIZED STEEL SHEET

Ferrous metals, being susceptible to corrosion, must be protected from the action of air and water to prevent deterioration from rusting. The most satisfactory protective process is one of galvanizing, zinc affording valuable electrochemical protection to steel.

The LIFE of a GALVANIZED STEEL SHEET

is dependent

upon the WEIGHT and PERFECTION of its zinc coating.

Produced entirely from the highest quality Australian steel—now recognised as being the equal of the finest British steel—Lysaght Steel Sheets are galvanized with an evenly deposited coating of protective zinc, the quality of which has long been a feature of Lysaght Galvanized Steel Sheet, effectively safeguarding the sheet from the effects of corrosion.

One of the best-known and most widely recommended building sheets in the world to-day is Lysaght Orb brand Corrugated Galvanized Steel Sheet. First introduced in England in 1857, and manufactured in Australia since 1921, Corrugated Galvanized Steel Sheet has proved itself unequalled for all types of roofing, walling and fencing projects, particularly where economy, ease of erection, great tensile strength, long life, and the ability to withstand the ravages of fire are important considerations. It has thus been used extensively in the construction of factories, storage bins, and silos, stables, dairies, as well as country homes.

Equally well and favourably known to the builder and plumber is Lysaght Queen's Head brand Galvanized Steel Sheet, now universally accepted as being the finest flat galvanized steel sheet for working-up purposes available to the trade.

Lysaght sheets conform to the standards set down by the Standards Association of Australia.

ZINCANNEAL

GENERAL.—Zincanneal quality sheets are an outstanding Lysaght development. By suitable high temperature treatment, zinc is combined with the steel base to form a zinc-iron alloy having remarkable properties as a coating. The resistance to atmospheric corrosion is particularly good, excellent service being obtained under severe conditions such as those met with in coastal locations. Zincanneal is marketed both as a flat sheet and a pressed panel known as V-crimp.

PAINTING.—Painting can be carried out immediately on erection or fabrication without priming or fear of subsequent peeling. Zincanneal is uninjured by heat up to a temperature of 600°F. It can be stove enamelled without damaging the protective surface in any way.

ZINCANNEAL SOLDERING.—Zincanneal is quite satisfactory for soldered joints, but it is generally found to require more care than ordinary galvanized sheets. The flux should be more active than that used with an ordinary galvanized sheet, and raw spirits, or 50% raw spirits and 50% killed spirits are recommended. Equally good results have been obtained with 60/40 and 50/50 solder. Experience has shown that the soldering iron should not be too hot.

WELDING.—Having a steel base, Zincanneal can be welded or brazed by any normal means. The heat generated by electric arc welding does not destroy the rust-resisting properties, and this material is quite suitable for spot welding. High pressure and high current should be employed, with a minimum time of application. Extensive weathering and corrosion tests have shown that in spite of the temperatures involved in the electric welding processes, considerable protection still remains at the weld.

NOTE.—Zincanneal coatings must NOT be confused with lead Terne coatings. Containers of Zincanneal are made to hold ice, water, and food, as in refrigerator cabinets and ice moulds, and the coatings are NOT injurious or poisonous in any way.

BRANDS AND QUALITIES CORRUGATED SHEET

RED ORB.—This universally known sheet has a uniformly heavy zinc coating applied to an especially hard steel base. The extreme rigidity and stiffness specially recommend it for applications such as roofing, walling, or fixing where maximum strength is required. This quality is available in 26 and 24 gauges, and is not suitable for curving.



BLUE ORB.—Blue Orb sheets carry the same high-grade coatings as Red Orb, applied to a ductile steel base of the highest quality. It is particularly suitable for applications requiring curving.



SECONDS.—A high-grade corrugated sheet, second only to Orb in quality and appearance, recommended for use where minor imperfections are not a consideration.

MILL REJECTS.—Complete sheets, which are not of a sufficiently high standard to be graded as seconds, but which are suitable for many applications where cost is of prime consideration. These sheets will have defects such as uncoated areas, corner and end faults, broken sides, and small holes; pinched and crinkled sheets are also included.

PACKING

GALVANIZED CORRUGATED.—All Red Orb sheets are packed in one-ton bundles or skidded packs. All Blue Orb sheets are packed in one-ton skidded packs. All corrugated Seconds and Mill Rejects are packed in one-ton bundles.

CORRUGATED SHEETS

Explanatory Notes on Brands and Sheet Marks

For the information of users, to facilitate identification and to provide means of determining the life of Australian-made sheets, Lysaght steel sheets carry certain identifying numbers and symbols.

DATE OF MANUFACTURE.—The day and number of the month of manufacture are stamped to the left and right of the Orb brand and the year of manufacture between the Orb and "Australia."



Sheets are branded on one side only, with the exception of 24G Blue Orb (which is used mainly for tankmaking).

On the reverse side to the normal brand is a Tect-A-Tank brand, incorporating the year of manufacture.



INSPECTOR'S NUMBER.—Between the brand and the end of the sheet is stamped the identification number of the inspector who passed the sheet.

PLACE OF ORIGIN.—Sheets manufactured at Port Kembla Works have the letter "K" incorporated in all brands.

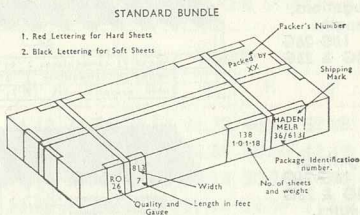
Sheets manufactured at Newcastle Works have the letter "N" incorporated in all brands.

GAUGE NUMBER.—Below the brand on all 16, 18, 20, 22, 24 and 26 gauge sheets are stamped the respective figures, 16G, 18G, 20G, 22G, 24G, 26G.

PACKING.—The packer's initials or number are stamped on the side of a skidded pack, and a packer's slip, giving the packer's initials and the date of packing, is included in all skidded packs and bundles.

PACK AND BUNDLE MARKINGS CORRUGATED SHEET — GALVANIZED

To facilitate identification, the following information is stencilled on skidded packs and bundles (see diagrams).



Quality.

Gauge and size.

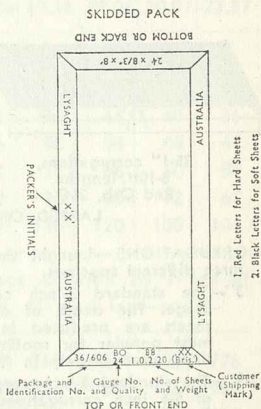
Number of sheets.

Weight.

Package Identification No.

Shipping Mark.

Packer's Initials.



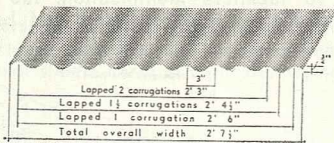
Red lettering is used for hard sheets and black for soft, both on a yellow background.

26G (1" Corr.) the size, number and weight of sheets is marked on the other end of the pack.

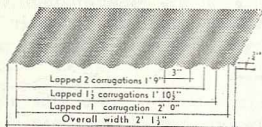
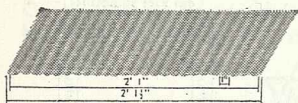
Markings for Seconds and Mill Rejects are the same as on packs containing primes, except for quality.

STANDARD CORRUGATED GALVANIZED STEEL SHEETS

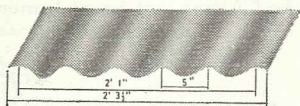
10-3" corrugations,
5-12ft. lengths
Blue Orb, 16G-26G
Red Orb, 24G & 26G



8-3" corrugations,
Blue Orb, 16G-26G
Red Orb, 24G & 26G
5-12ft. lengths.



25-1" corrugations,
5-10ft. lengths
Red Orb, 26G



5-5" corrugations,
5-12ft. lengths
Blue Orb, 12G-20G

LAPPED ONE CORRUGATION

CORRUGATIONS.—Lysaght sheets are produced in corrugations of three different spacings.

3"—The standard 3-inch corrugation is the pitch in common usage. The depth of corrugation is approximately $\frac{3}{4}$ ", and sheets are produced in two widths: 10-3 inch corrugations, most popular for roofing and siding; and 8-3 inch corrugations, used largely in the Blue Orb quality for tank-making.

5"—The standard 5-inch corrugated pitch is produced in a width of 5-5 inch corrugations $1\frac{1}{4}$ " deep. This corrugation is used for heavy-gauge sheets. These are recommended for wide unsupported coverage tasks, such as awnings, where maximum strength of the sheet as a beam is desirable, or for domestic or industrial roofs.

1"—The standard 1-inch corrugation sheet, produced in 26G only, is 25 corrugations wide, $\frac{1}{4}$ " deep. This sheet is most popular for linings, awnings, ceilings, showers, or sheds and country halls, and is gaining an increased popularity as division walls in large country stores.

8-3in. CORRUGATED GALVANIZED STEEL SHEET

APPROXIMATE WEIGHT PER SHEET—LBS.

Gauge	Length							
	5'	6'	7'	8'	9'	10'	11'	12'
18	26.18	31.36	36.54	41.72	46.90	52.08	57.27	62.45
20	21.21	25.40	29.60	33.80	38.00	42.19	46.39	50.59
22	17.18	20.58	23.98	27.38	30.78	34.18	37.58	40.98
24	13.89	16.64	19.39	22.14	24.89	27.64	30.38	33.13
26	9.55	11.45	13.36	15.26	17.16	19.06	20.97	22.87

COUNT OF SHEETS PER NOMINAL TON

18	86	72	62	54	48	44	40	36
20	106	88	76	66	58	54	48	44
22	130	108	94	82	72	66	60	54
24	160	136	116	100	92	80	72	68
26	235	195	165	150	130	120	105	100

COVERAGE.—Mean area of surface covered by 1 ton of sheet— $1\frac{1}{2}$ corrugations side lap, 6" end lap—sq. ft.

18	726	743	756	759	765	784	788	776
20	894	908	926	928	924	962	945	949
22	1097	1114	1146	1153	1148	1176	1181	1164
24	1350	1403	1414	1406	1466	1425	1418	1466
26	1983	2011	2011	2109	2072	2138	2067	2156

NOTE.—Following long-established British practice, 26-gauge Galvanized Steel Sheet, both corrugated and plain, manufactured in Australia, is lighter than true 26 gauge.

10-3in. CORRUGATED GALVANIZED STEEL SHEET

APPROXIMATE WEIGHT PER SHEET—LBS.

Gauge	Length							
	5'	6'	7'	8'	9'	10'	11'	12'
18	32.06	38.40	44.75	51.09	57.44	63.78	70.13	76.47
20	25.97	31.11	36.25	41.39	46.53	51.67	56.81	61.95
22	21.04	25.20	29.36	33.53	37.69	41.85	46.02	50.18
24	17.01	20.38	23.74	27.11	30.48	33.84	37.21	40.58
26	11.70	14.03	16.36	18.69	21.02	23.34	25.67	28.00

COUNT OF SHEETS PER NOMINAL TON

18	70	58	50	44	40	36	32	29
20	86	72	62	54	48	44	40	36
22	106	88	76	66	60	54	48	44
24	132	108	96	84	72	68	60	56
26	195	160	135	120	105	95	90	80

COVERAGE.—Mean area of surface covered by 1 ton of sheet— $1\frac{1}{2}$ corrugations side lap, 6" end lap—sq. ft.

18	748	758	772	784	808	812	798	792
20	919	941	957	962	969	993	998	983
22	1133	1150	1173	1176	1211	1218	1197	1202
24	1411	1411	1482	1496	1454	1534	1496	1530
26	2084	2090	2084	2138	2120	2143	2244	2185

NOTE.—Following long-established British practice, 26-gauge Galvanized Steel Sheet, both corrugated and plain, manufactured in Australia, is lighter than true 26 gauge.

5-5in. CORRUGATED GALVANIZED STEEL SHEET

APPROXIMATE WEIGHT PER SHEET—LBS.

Gauge	Length				
	6'	7'	8'	9'	10'
16	41.58	48.45	55.32	62.19	69.06
18	33.22	38.71	44.20	49.69	55.17
20	26.91	31.36	35.80	40.25	44.70

COUNT OF SHEETS PER ONE-TON SKIDDED PACK

16	54	46	40	36	32
18	67	58	51	45	41
20	83	71	63	56	50

COVERAGE.—Mean area of surface covered by 1 ton of Sheet— $1\frac{1}{2}$ corrugations side lap, 6" end lap—sq. ft.

16	601	603	604	615	610
18	746	760	770	768	781
20	924	931	951	956	952

25-1in. CORRUGATED GALVANIZED STEEL SHEET

APPROXIMATE WEIGHT PER SHEET—LBS.

Gauge	Length						
	6'	7'	8'	9'	10'	11'	12'
26	10.78	12.57	14.36	16.15	17.94	19.73	21.53

COUNT OF SHEETS PER ONE-TON SKIDDED PACK

26	208	178	156	139	125	114	104
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GALVANIZED FLAT SHEETS

QUEEN'S HEAD.—Prime sheets of Lysaght galvanized flat steel sheets are branded with the well-known Queen's Head brand. These quality flat sheets are the most uniform and reliable plain galvanized sheets on the market.

LYSAGHT



QUEEN'S HEAD

AUSTRALIA

GALVABOND.—Galvabond is a zinc-coated sheet produced by the continuous galvanizing process. The coating is very adherent, and will withstand the most severe operations without peeling. Because of its superior coating adhesion it will generally be preferred to Queen's Head for roll forming, pressing and lock seaming. The weight of coating on Galvabond is the same as on Queen's Head, and all data on packing counts and sheet weights given for Queen's Head applies equally to Galvabond.

SECONDS.—A high-grade galvanized flat sheet, for that class of work in which a cheaper sheet is asked for. It will be found equal to all such requirements.

EXPLANATORY NOTES ON MARKINGS OF FLAT SHEETS.—For the information of users, the year of manufacture is incorporated in the frame of the Queen's Head brand, the figures being located at the base of the Queen's neck. Figures on either side of the brand show the day and month of manufacture. Sheets are branded on one side only, and sheets manufactured at Port Kembla Works have the letter "K" shown in all brands, and sheets manufactured at Newcastle Works have the letter "N" shown in all brands. Between the brand and the end of the sheet is stamped the identification number of the inspector who passed the sheet. The packer's initials are stencilled on the side of the skidded pack, and the packer's slip, giving the packer's initials and date of packing, is enclosed in all skidded packs. Should you find it necessary to make a complaint, please endeavour to quote packer's initials, inspector's number, year of manufacture, and any other details that might assist us to investigate and remedy your complaint.

Queen's Head: 18G and lighter, one or two-ton skidded packs; 16G and heavier, one or two-ton bundles, one or two-ton skidded packs. Seconds: As for Q.H. Mill Rejects Flat: As for Q.H.

Red Orb: All gauges—one-ton bundles. (Alternate packs are used under special circumstances.)

Blue Orb: All gauges, one-ton skidded packs; Seconds and Mill Rejects, one-ton bundles.

Z.A. Panel and R.L.: All gauges—one-ton skidded packs. Seconds—one-ton skidded packs.

Terne Plate: All gauges—one-ton skidded packs. Seconds—one-ton skidded packs.

ZINCANNEAL

GENERAL.—Zincanneal flat sheets are produced in two standard qualities—Zincanneal Roller Levelled (Z.A.R.L.) and Zincanneal Panel.

LYSAGHT
ZINCANNEAL
AUSTRALIA
PANEL QUALITY

Z.A.
SECONDS

PANEL QUALITY

ZINCANNEAL PANEL.—These sheets are subjected to a final surface-improvement process, and finished dead flat. The surface provides an ideal base for baked enamels and similar fine finishes. It is eminently suited to the manufacture of steel furniture, panelling, signboards, louvres, acoustic tiles, etc.

LYSAGHT
ZINCANNEAL
AUSTRALIA

Z.A.
SECONDS

R.L.

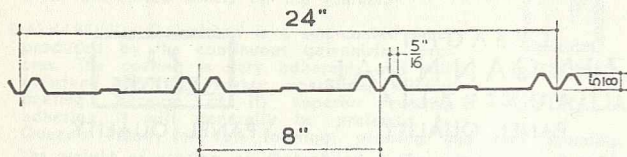
R.L.

Z.A.R.L.—This quality is roller levelled after coating to improve the flatness. It is especially suited for applications requiring a paint finish where a perfectly flat sheet is not essential. Of its many uses, air-conditioning units, louvres, signboards, rainwater goods and agricultural equipment are typical.

SECONDS.—As a result of the stringent inspection standards applied in the manufacture of Lysaght sheets, some material is produced which falls outside the acceptable limits for Prime Sheets, and are consequently classed as Seconds. These sheets may carry small uncoated areas, broken corners, or broken sides. Appearance defects such as tree marks, metal spots and stains may also be included.

PACKING.—All Zincanneal sheets are packed in galvanized skidded packs of unit weight approximately one ton.

LYSAGHT V-CRIMP ZINCANNEAL STEEL SHEET



V-Crimp is an attractive panel for exterior walls, garage doors, eaves, awning soffits, internal ceilings, decorative shop fronts and similar applications.

MATERIAL. — V-Crimp is formed from Panel Quality Zincanneal Steel Sheets, and can be painted immediately without priming. Thicknesses are 24 and 26 gauge and standard lengths are 6, 7, 8, 9 and 10ft.

LAPS.—The recommended minimum end lap is 3"; side laps should be two full crimps.

DATA ON V-CRIMP SHEETS

Item	Gauge	6'	7'	8'	9'	10'
Weight per sheet in lbs.	26	12.7	14.8	17.0	19.1	21.2
	24	15.9	18.5	21.2	23.8	26.4
Average count of sheets per $\frac{1}{2}$ ton case.	26	83	71	62	55	50
	24	67	57	50	44	40
Number of sheets required for 100 sq. ft. coverage with 3" end laps.		8.7	7.4	6.4	5.7	5.1

SKIDDED PACK OR BUNDLE MARKINGS

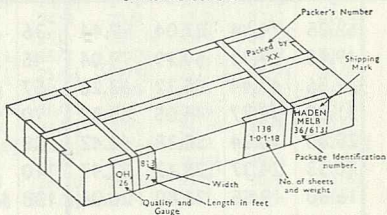
Flat Sheet — Galvanized and Zincaneal

GALVANIZED

QUEEN'S HEAD.—When in bundles the number and weight of sheets is stencilled on a clip in the side of the bundle. 14G and heavier are not branded, the tally being marked Q.H.N.B.

Similar identification markings are stencilled on skidded packs and bundles in the same manner used for corrugated sheets. Details include:—

STANDARD BUNDLE



Quality.

Gauge and size.

Number of sheets.

Weight.

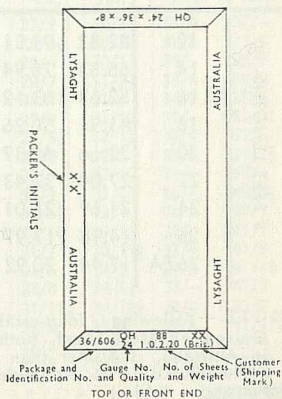
Package Identification No.

Shipping Mark.

Packer's Initials.

SKIDDED PACK

BOTTOM OR BACK END



FLAT SHEETS

GALVANIZED AND ZINCANNEAL

		Approximate Weight Per Sheet in lbs.				Count of Sheets Per Nominal Ton			
	Gauge	Width				Width			
		30"	36"	42"	48"	30"	36"	42"	48"
6 FEET LENGTHS	12	62.25	74.64	87.04	99.44	36	30	26	23
	14	49.48	59.33	69.19	79.04	45	38	32	28
	16	39.56	47.44	55.32	63.20	57	47	40	35
	18	31.50	37.77	44.05	50.32	70	60	51	44
	20	25.30	30.34	35.38	40.42	88	74	63	56
	22	20.33	24.37	28.42	32.47	110	92	79	68
	24	16.30	19.55	22.80	26.04	138	114	98	86
	26	11.25	13.49	15.73	17.97	200	166	141	124
	26ZA	13.11	15.72	18.33	20.94	171	142	122	107
8 FEET LENGTHS	12	82.82	99.31	115.81	132.30	28	23	19	17
	14	65.83	78.94	92.05	105.16	34	28	24	21
	16	52.63	63.12	73.60	84.08	43	35	30	27
	18	41.91	50.26	58.61	66.95	54	44	38	34
	20	33.66	40.37	47.07	53.78	66	56	48	42
	22	27.04	32.43	37.81	43.20	82	68	59	52
	24	21.69	26.01	30.33	34.65	103	86	74	64
	26	14.98	17.97	20.95	23.94	150	124	106	94
	26ZA	17.44	20.92	24.39	27.86	128	107	92	80

NOTE.—Following long-established British practice, 26-gauge Galvanized Steel Sheet, both corrugated and plain, manufactured in Australia, is lighter than true 26G. and, as Zincanneal is now manufactured in 26 Birmingham gauge, both values are given in the above tables.

PRICE
PER
SHEET**8 x 3"****CORRUGATIONS**
GALVANIZED STEEL SHEET

APPROX. PRICES PER SHEET BASED ON GIVEN RATES PER TON Gauge

Price per ton	106 Sheets 5ft.	88 Sheets 6ft.	76 Sheets 7ft.	66 Sheets 8ft.	58 Sheets 9ft.	54 Sheets 10ft.	48 Sheets 11ft.	44 Sheets 12ft.	20
£100	18/10½	22/9	26/4	30/3½	34/6	37/-	41/8	45/5½	
£101	19/0½	22/11½	26/7	30/7½	34/10	37/5	42/1	45/11	
£102	19/3	23/2	26/10	30/11	35/2	37/9	42/6	46/4½	
£103	19/5	23/5	27/1½	31/2½	35/6	38/2	42/11	46/10	
£104	19/7½	23/7½	27/4½	31/6	35/10½	38/6	43/4	47/3½	
£105	19/9½	23/10½	27/7½	31/10	36/2½	38/11	43/9	47/8½	
£106	20/-	24/1	27/10½	32/1½	36/6½	39/3	44/2	48/2	
£107	20/2½	24/4	28/2	32/5	36/11	39/7½	44/7	48/7½	
£108	20/4½	24/6½	28/5	32/8½	37/3	40/-	45/-	49/1	
£109	20/7	24/9	28/8	33/0½	37/7	40/4½	45/5	49/6½	
£110	20/9	25/-	28/11½	33/4	37/11	40/9	45/10	50/-	
£111	20/11½	25/3	29/2½	33/7½	38/3	41/1	46/3	50/5½	
£112	21/1½	25/5½	29/5½	33/11½	38/7½	41/6	46/8	50/11	
£113	21/4	25/8	29/9	34/3	38/11½	41/10	47/1	51/4½	
£114	21/6	25/11	30/-	34/6½	39/4	42/3	47/6	51/10	
£115	21/8½	26/1½	30/3	34/10	39/8	42/7	47/11	52/3½	
£116	21/10½	26/4½	30/6½	35/2	40/-	42/11½	48/4	52/8½	
£117	22/1	26/7	30/9½	35/5½	40/4	43/4	48/9	53/2	
£118	22/3	26/10	31/0½	35/9	40/8	43/8½	49/2	53/7½	
£119	22/5½	27/0½	31/4	36/1	41/-	44/1	49/7	54/1	

Price per ton	130 Sheets 5ft.	108 Sheets 6ft.	94 Sheets 7ft.	82 Sheets 8ft.	72 Sheets 9ft.	66 Sheets 10ft.	60 Sheets 11ft.	54 Sheets 12ft.	22
£100	15/4½	18/6	21/3	24/4½	27/9	30/3½	33/4	37/-	
£101	15/6½	18/8½	21/6	24/7½	28/0½	30/7½	33/8	37/5	
£102	15/8½	18/11	21/8½	24/10½	28/4	30/11	34/-	37/9	
£103	15/10	19/1	21/11	25/1½	28/7	31/2½	34/4	38/2	
£104	16/-	19/3	22/1½	25/4½	28/11	31/6	34/8	38/6	
£105	16/2	19/5½	22/4	25/7½	29/2	31/10	35/-	38/11	
£106	16/3½	19/7½	22/6½	25/10	29/5½	32/1½	35/4	39/3	
£107	16/5½	19/10	22/9	26/1	29/9	32/5	35/8	39/7½	
£108	16/7½	20/-	22/11½	26/4	30/-	32/8½	36/-	40/-	
£109	16/9	20/2	23/2	26/7	30/3	33/0½	36/4	40/4½	
£110	16/11	20/4½	23/5	26/10	30/6½	33/4	36/8	40/9	
£111	17/1	20/6½	23/7	27/1	30/10	33/7½	37/-	41/1	
£112	17/3	20/9	23/10	27/4	31/1	33/11½	37/4	41/6	
£113	17/4½	20/11	24/0½	27/6½	31/5	34/3	37/8	41/10	
£114	17/6½	21/1	24/3	27/9½	31/8	34/6½	38/-	42/3	
£115	17/8½	21/3½	24/6	28/0½	31/11½	34/10½	38/4	42/7	
£116	17/10	21/6	24/8	28/3½	32/3	35/2	38/8	42/11½	
£117	18/-	21/8	24/11	28/6½	32/6	35/5½	39/-	43/4	
£118	18/2	21/10	25/1	28/9½	32/9	35/9	39/4	43/8½	

THIS TABLE IS NOT A PRICE LIST

PRICE
PER
SHEET

8 x 3"

CORRUGATIONS
GALVANIZED STEEL SHEET

APPROX. PRICES PER SHEET BASED ON GIVEN RATES PER TON

Gauge

24

Price per ton	160 Sheets 5ft.	136 Sheets 6ft.	116 Sheets 7ft.	100 Sheets 8ft.	92 Sheets 9ft.	80 Sheets 10ft.	72 Sheets 11ft.	68 Sheets 12ft.
£100	12/6	14/8½	17/3	20/-	21/9	25/-	27/9	29/5
£101	12/7½	14/10	17/5	20/2½	21/11½	25/3	28/0½	29/8½
£102	12/9	15/-	17/7	20/5	22/2	25/6	28/4	30/-
£103	12/10½	15/2	17/9	20/7	22/5	25/9	28/7	30/3½
£104	13/-	15/3½	17/11	20/10	22/7	26/-	28/11	30/7
£105	13/1½	15/5½	18/1	21/-	22/10	26/3	29/2	30/10½
£106	13/3	15/7	18/3½	21/2½	23/0½	26/6	29/5½	31/2
£107	13/4½	15/9	18/5½	21/5	23/3	26/9	29/9	31/5½
£108	13/6	15/11	18/7½	21/7	23/5½	27/-	30/-	31/9
£109	13/7½	16/-	18/9½	21/10	23/8	27/3	30/3	32/0½
£110	13/9	16/2	18/11½	22/-	23/11	27/6	30/6½	32/4
£111	13/10½	16/4	19/1½	22/2½	24/1½	27/9	30/10	32/8
£112	14/-	16/5½	19/3½	22/5	24/4	28/-	31/1	32/11½
£113	14/1½	16/7	19/6	22/7	24/7	28/3	31/5	33/3
£114	14/3	16/9	19/8	22/10	24/9½	28/6	31/8	33/6½
£115	14/4½	16/11	19/10	23/-	25/-	28/9	31/11½	33/10
£116	14/6	17/0½	20/-	23/2½	25/2½	29/-	32/3	34/1½
£117	14/7½	17/2½	20/2	23/5	25/5	29/3	32/6	34/5
£118	14/9	17/4	20/4	23/7	25/8	29/6	32/9	34/8½
£119	14/10½	17/6	20/6	23/10	25/10½	29/9	33/0½	35/-

Gauge

26

Price per ton	235 Sheets 5ft.	195 Sheets 6ft.	165 Sheets 7ft.	150 Sheets 8ft.	130 Sheets 9ft.	120 Sheets 10ft.	105 Sheets 11ft.	100 Sheets 12ft.
£100	8/6	10/3	12/1½	13/4	15/5	16/8	19/0½	20/-
£101	8/7	10/4	12/3	13/5½	15/6	16/10	19/3	20/2½
£102	8/8	10/5½	12/4½	13/7	15/8	17/-	19/5	20/5
£103	8/9	10/7	12/6	13/9	15/10	17/2	19/7	20/7
£104	8/10	10/8	12/7	13/10½	16/-	17/4	19/10	20/10
£105	8/11	10/9	12/9	14/-	16/2	17/6	20/-	21/-
£106	9/0½	10/10½	12/10	14/1½	16/4	17/8	20/2	21/2½
£107	9/1½	11/-	12/11½	14/3	16/5½	17/10	20/5	21/5
£108	9/2½	11/1	13/1	14/5	16/7	18/-	20/7	21/7
£109	9/3½	11/2	13/2½	14/6	16/9	18/2	20/9	21/10
£110	9/4½	11/3½	13/4	14/8	16/11	18/4	20/11½	22/-
£111	9/5½	11/5	13/5½	14/9½	17/1	18/6	21/2	22/2½
£112	9/6½	11/6	13/7	14/11	17/3	18/8	21/4	22/5
£113	9/7½	11/7	13/8	15/1	17/5	18/10	21/6	22/7
£114	9/8½	11/8	13/10	15/2	17/6	19/-	21/8½	22/10
£115	9/9½	11/9½	13/11	15/4	17/8	19/2	21/11	23/-
£116	9/10½	11/11	14/1	15/5½	17/10	19/4	22/1	23/2½
£117	9/11½	12/-	14/2	15/7	18/-	19/6	22/3½	23/5
£118	10/0½	12/1	14/4	15/9	18/2	19/8	22/6	23/7
£119	10/1½	12/2½	14/5	15/10½	18/4	19/10	22/8	23/10

THIS TABLE IS NOT A PRICE LIST

PRICE
PER
SHEET**10 x 3" CORRUGATIONS**
GALVANIZED STEEL SHEET

APPROX. PRICES PER SHEET BASED ON GIVEN RATES PER TON

Price per ton	Gauge								20
	86 Sheets 5ft.	72 Sheets 6ft.	62 Sheets 7ft.	54 Sheets 8ft.	48 Sheets 9ft.	44 Sheets 10ft.	40 Sheets 11ft.	36 Sheets 12ft.	
£100	23/3	27/9½	32/3	37/-	41/8	45/5½	50/-	55/6½	
£101	23/6	28/0½	32/7	37/5	42/1	45/11	50/6	56/1½	
£102	23/8½	28/4	32/11	37/9½	42/6	46/4½	51/-	56/8	
£103	23/11½	28/7½	33/2½	38/2	42/11	46/10	51/6	57/2½	
£104	24/2	28/10½	33/6½	38/6	43/4	47/3½	52/-	57/9½	
£105	24/5	29/2	33/10½	38/11	43/9	47/8½	52/6	58/4	
£106	24/8	29/5½	34/2½	39/3	44/2	48/2	53/-	58/10½	
£107	24/10½	29/8½	34/6	39/7½	44/7	48/7½	53/6	59/5½	
£108	25/1½	30/-	34/10	40/-	45/-	49/1	54/-	60/-	
£109	25/4	30/3½	35/2	40/4½	45/5	49/6½	54/6	60/6½	
£110	25/7	30/6½	35/6	40/9	45/10	50/-	55/-	61/1½	
£111	25/10	30/10	35/9½	41/1½	46/3	50/5½	55/6	61/8	
£112	26/0½	31/1½	36/1½	41/6	46/8	50/11	56/-	62/2½	
£113	26/3½	31/4½	36/5½	41/10	47/1	51/4½	56/6	62/9½	
£114	26/6	31/8	36/9½	42/2½	47/6	51/10	57/-	63/4	
£115	26/9	31/11½	37/1	42/7	47/11	52/3½	57/6	63/10½	
£116	26/11½	32/2½	37/5	42/11½	48/4	52/8½	58/-	64/5½	
£117	27/2½	32/6	37/9	43/4	48/9	53/2	58/6	65/-	
£118	27/5½	32/9½	38/1	43/8½	49/2	53/7½	59/-	65/6½	
£119	27/8	33/0½	38/4½	44/1	49/7	54/1	59/6	66/1½	

Price per ton	Gauge								22
	106 Sheets 5ft.	88 Sheets 6ft.	76 Sheets 7ft.	66 Sheets 8ft.	60 Sheets 9ft.	54 Sheets 10ft.	48 Sheets 11ft.	44 Sheets 12ft.	
£100	18/10½	22/9	26/4	30/3½	33/4	37/-	41/8	45/5½	
£101	19/0½	22/11½	26/7	30/7½	33/8	37/5	42/1	45/11	
£102	19/3	23/2	26/10	30/11	34/-	37/9½	42/6	46/4½	
£103	19/5	23/5	27/1½	31/2½	34/4	38/2	42/11	46/10	
£104	19/7½	23/7½	27/4½	31/6	34/8	38/6	43/4	47/3½	
£105	19/9½	23/10½	27/7½	31/10	35/-	38/11	43/9	47/8½	
£106	20/-	24/1	27/10½	32/1½	35/4	39/3	44/2	48/2	
£107	20/2½	24/4	28/2	32/5	35/8	39/7½	44/7	48/7½	
£108	20/4½	24/6½	28/5	32/8½	36/-	40/-	45/-	49/1	
£109	20/7	24/9	28/8	33/0½	36/4	40/4½	45/5	49/6½	
£110	20/9	25/-	28/11½	33/4	36/8	40/9	45/10	50/-	
£111	20/11½	25/3	29/2½	33/7½	37/-	41/1½	46/3	50/5½	
£112	21/1½	25/5½	29/5½	33/11½	37/4	41/6	46/8	50/11	
£113	21/4	25/8	29/9	34/3	37/8	41/10	47/1	51/4½	
£114	21/6	25/11	30/-	34/6½	38/-	42/2½	47/6	51/10	
£115	21/8½	26/1½	30/3	34/10	38/4	42/7	47/11	52/3½	
£116	21/10½	26/4½	30/6½	35/2	38/8	42/11½	48/4	52/8½	
£117	22/1	26/7	30/9½	35/5½	39/-	43/4	48/9	53/2	
£118	22/3	26/10	31/0½	35/9	39/4	43/8½	49/2	53/7½	
£119	22/5½	27/0½	31/4	36/1	39/8	44/1	49/7	54/1	

THIS TABLE IS NOT A PRICE LIST

PRICE
PER
SHEET

10 x 3"

CORRUGATIONS

GALVANIZED STEEL SHEET

APPROX. PRICES PER SHEET BASED ON GIVEN RATES PER TON

Gauge

24

Price per ton	132 Sheets 5ft.	108 Sheets 6ft.	96 Sheets 7ft.	84 Sheets 8ft.	72 Sheets 9ft.	68 Sheets 10ft.	60 Sheets 11ft.	56 Sheets 12ft.
£100	15/2	18/6	20/10	23/10	27/9	29/5	33/4	35/8½
£101	15/3½	18/8½	21/0½	24/0½	28/0½	29/8½	33/8	36/1
£102	15/5½	18/11	21/3	24/3½	28/4	30/-	34/-	36/5
£103	15/7½	19/1	21/5½	24/6	28/7	30/3½	34/4	36/9½
£104	15/9	19/3	21/8	24/9	28/11	30/7	34/8	37/2
£105	15/11	19/5½	21/10½	25/-	29/2	30/10½	35/-	37/6
£106	16/0½	19/7½	22/1	25/2½	29/5½	31/2	35/4	37/10
£107	16/2½	19/10	22/3½	25/6	29/9	31/5½	35/8	38/2½
£108	16/4½	20/-	22/6	25/8½	30/-	31/9	36/-	38/7
£109	16/6	20/2	22/8½	25/11½	30/3	32/0½	36/4	38/11
£110	16/8	20/4½	22/11	26/2	30/6½	32/4	36/8	39/3½
£111	16/10	20/6½	23/1½	26/5	30/10	32/8	37/-	39/8
£112	16/11½	20/9	23/4	26/8	31/1	32/11½	37/4	40/-
£113	17/1½	20/11	23/6½	26/11	31/5	33/3	37/8	40/4
£114	17/3½	21/1	23/9	27/2	31/8	33/6½	38/-	40/8½
£115	17/5	21/3½	23/11½	27/5	31/11½	33/10	38/4	41/1
£116	17/7	21/6	24/2	27/7½	32/3	34/1½	38/8	41/5
£117	17/8½	21/8	24/4½	27/10	32/6	34/5	39/-	41/9½
£118	17/10½	21/10	24/7	28/1	32/9	34/8½	39/4	42/2
£119	18/0½	22/-	24/9½	28/4	33/0½	35/-	39/8	42/6

Gauge

26

Price per ton	195 Sheets 5ft.	160 Sheets 6ft.	135 Sheets 7ft.	120 Sheets 8ft.	105 Sheets 9ft.	95 Sheets 10ft.	90 Sheets 11ft.	80 Sheets 12ft.
£100	10/3	12/6	14/10	16/8	19/0½	21/0½	22/3	25/-
£101	10/4	12/7½	15/-	16/10	19/3	21/3	22/5½	25/3
£102	10/5½	12/9	15/1	17/-	19/5	21/6	22/8	25/6
£103	10/7	12/10½	15/3	17/2	19/7	21/8	22/11	25/9
£104	10/8	13/-	15/5	17/4	19/10	21/11	23/1	26/-
£105	10/9	13/1½	15/6½	17/6	20/-	22/1	23/4	26/3
£106	10/10½	13/3	15/8½	17/8	20/2	22/4	23/6½	26/6
£107	11/-	13/4½	15/10	17/10	20/5	22/6	23/9	26/9
£108	11/1	13/6	16/-	18/-	20/7	22/9	24/-	27/-
£109	11/2	13/7½	16/2	18/2	20/9	22/11½	24/3	27/3
£110	11/3½	13/9	16/3½	18/4	20/11½	23/2	24/5½	27/6
£111	11/5	13/10½	16/5½	18/6	21/2	23/4½	24/8	27/9
£112	11/6	14/-	16/7	18/8	21/4	23/7	24/11	28/-
£113	11/7	14/1½	16/9	18/10	21/6	23/9½	25/1	28/3
£114	11/8	14/3	16/11	19/-	21/8½	24/-	25/4	28/6
£115	11/9½	14/4½	17/-	19/2	21/11	24/2½	25/6½	28/9
£116	11/11	14/6	17/2	19/4	22/1	24/5	25/9	29/-
£117	12/-	14/7½	17/4	19/6	22/3½	24/7½	26/-	29/3
£118	12/1	14/9	17/6	19/8	22/6	24/10	26/3	29/6
£119	12/2½	14/10½	17/7½	19/10	22/8	25/0½	26/5½	29/9

THIS TABLE IS NOT A PRICE LIST

PRICE
PER
SHEET

FLAT

GALVANIZED &
ZINCANNEAL

APPROX. PRICES PER SHEET BASED ON GIVEN RATES PER TON

Price per ton	6' Lengths				8' Lengths				Gauge
	111 Sheets 24in.	88 Sheets 30in.	74 Sheets 36in.	56 Sheets 48in.	83 Sheets 24in.	66 Sheets 30in.	56 Sheets 36in.	42 Sheets 48in.	20
£100	18/2	22/9	27/0½	35/8½	24/1	30/3½	35/8½	47/7½	
£101	18/4½	22/11½	27/3½	36/1	24/4	30/7½	36/1	48/1	
£102	18/6½	23/2	27/7	36/5	24/7	30/11	36/5	48/7	
£103	18/8½	23/5	27/10	36/9½	24/10	31/2½	36/9½	49/0½	
£104	18/11	23/7½	28/1½	37/2	25/0½	31/6	37/2	49/6½	
£105	19/1	23/10½	28/4½	37/6	25/3½	31/10	37/6	50/-	
£106	19/3½	24/1	28/8	37/10	25/6½	32/1½	37/10	50/5½	
£107	19/5½	24/4	28/11	38/2½	25/9½	32/5	38/2½	50/11½	
£108	19/7½	24/6½	29/2½	38/7	26/-	32/8½	38/7	51/5	
£109	19/10	24/9	29/5½	38/11	26/3	33/0½	38/11	51/11	
£110	20/-	25/-	29/9	39/3½	26/6	33/4	39/3½	52/4½	
£111	20/2	25/3	30/-	39/8	26/9	33/7½	39/8	52/10½	
£112	20/4½	25/5½	30/3	40/-	27/-	33/11½	40/-	53/4	
£113	20/6½	25/8	30/6½	40/4	27/2½	34/3	40/4	53/9½	
£114	20/8½	25/11	30/9½	40/8½	27/5½	34/6½	40/8½	54/3½	
£115	20/11	26/1½	31/1	41/1	27/8½	34/10	41/1	54/9	
£116	21/1	26/4½	31/4	41/5	27/11½	35/2	41/5	55/3	
£117	21/3½	26/7	31/7½	41/9½	28/2½	35/5½	41/9½	55/8½	
£118	21/5½	26/10	31/10½	42/2	28/5	35/9	42/2	56/2½	

Price per ton	6' Lengths				8' Lengths				Gauge
	138 Sheets 24in.	110 Sheets 30in.	92 Sheets 36in.	68 Sheets 48in.	103 Sheets 24in.	82 Sheets 30in.	68 Sheets 36in.	52 Sheets 48in.	22
£100	14/6	18/2	21/9	29/5	19/5	24/4½	29/5	38/5½	
£101	14/7½	18/4½	21/11½	29/8½	19/7½	24/7½	29/8½	38/10	
£102	14/9½	18/6½	22/2	30/-	19/9½	24/10½	30/-	39/3	
£103	14/11	18/8½	22/4½	30/3½	20/-	25/1½	30/3½	39/7½	
£104	15/1	18/11	22/7½	30/7	20/2½	25/4½	30/7	40/-	
£105	15/2½	19/1	22/10	30/10½	20/4½	25/7½	30/10½	40/4½	
£106	15/4½	19/3½	23/0½	31/2	20/7	25/10	31/2	40/9	
£107	15/6	19/5½	23/3	31/5½	20/9½	26/1	31/5½	41/2	
£108	15/8	19/7½	23/5½	31/9	20/11½	26/4	31/9	41/6½	
£109	15/9½	19/10	23/8½	32/0½	21/2	26/7	32/0½	41/11	
£110	15/11½	20/-	23/11	32/4	21/4½	26/10	32/4	42/3½	
£111	16/1	20/2	24/1½	32/8	21/6½	27/1	32/8	42/8½	
£112	16/3	20/4½	24/4	32/11½	21/9	27/4	32/11½	43/1	
£113	16/4½	20/6½	24/7	33/3	21/11½	27/6½	33/3	43/5½	
£114	16/6½	20/8	24/9½	33/6½	22/1½	27/9½	33/6½	43/10	
£115	16/8	20/11	25/-	33/10	22/4	28/0½	33/10	44/3	
£116	16/9½	21/1	25/2½	34/1½	22/6½	28/3½	34/1½	44/7½	
£117	16/11½	21/3½	25/5	34/5	22/8½	28/6½	34/5	45/-	
£118	17/1	21/5½	25/8	34/8½	22/11	28/9½	34/8½	45/4½	

THIS TABLE IS NOT A PRICE LIST

PRICE
PER
SHEET

FLAT

GALVANIZED &
ZINC ANNEAL

APPROX. PRICES PER SHEET BASED ON GIVEN RATES PER TON

Gauge

24

Price per ton	6' Lengths				8' Lengths			
	172 Sheets 24in.	138 Sheets 30in.	114 Sheets 36in.	86 Sheets 48in.	128 Sheets 24in.	103 Sheets 30in.	86 Sheets 36in.	64 Sheets 48in.
£100	11/7½	14/6	17/6½	23/3	15/7½	18/10½	23/3	31/3
£101	11/9	14/7½	17/8½	23/6	15/9½	19/0½	23/6	31/7
£102	11/10½	14/9½	17/11	23/8½	15/11	19/3	23/8½	31/10½
£103	11/11½	14/11	18/1	23/11½	16/1	19/5	23/11½	32/2
£104	12/1	15/1	18/3	24/2	16/3	19/7½	24/2	32/6
£105	12/2½	15/2½	18/5	24/5	16/5	19/9½	24/5	32/10
£106	12/4	15/4½	18/7	24/8	16/7	20/-	24/8	33/1½
£107	12/5½	15/6	18/9	24/10½	16/8½	20/2½	24/10½	33/5
£108	12/6½	15/8	18/11½	25/1½	16/10½	20/4½	25/1½	33/9
£109	12/8	15/9½	19/1½	25/4	17/-	20/7	25/4	34/1
£110	12/9½	15/11½	19/3½	25/7	17/2	20/9	25/7	34/4½
£111	12/11	16/1	19/6	25/10	17/4	20/11½	25/10	34/8
£112	13/0½	16/3	19/8	26/0½	17/6	21/1½	26/0½	35/-
£113	13/1½	16/4½	19/10	26/3½	17/8	21/4	26/3½	35/4
£114	13/3	16/6	20/-	26/6	17/10	21/6	26/6	35/7½
£115	13/4½	16/8	20/2	26/9	18/-	21/8½	26/9	35/11
£116	13/6	16/10	20/4	26/11½	18/1½	21/10½	26/11½	36/3
£117	13/7½	16/11½	20/6	27/2½	18/3½	22/1	27/2½	36/7
£118	13/8½	17/1	20/8½	27/5½	18/5	22/3	27/5½	36/10½

Gauge

26

Price per ton	6' Lengths				8' Lengths			
	250 Sheets 24in.	200 Sheets 30in.	166 Sheets 36in.	124 Sheets 48in.	188 Sheets 24in.	150 Sheets 30in.	124 Sheets 36in.	94 Sheets 48in.
£100	8/-	10/-	12/0½	16/1½	10/7½	13/4	16/1½	21/3½
£101	8/1	10/1	12/2	16/3½	10/9	13/5½	16/3½	21/6
£102	8/2	10/2½	12/3½	16/5½	10/10	13/7	16/5½	21/8½
£103	8/3	10/3½	12/5	16/7	10/11½	13/9	16/7	21/11
£104	8/4	10/5	12/6½	16/9	11/1	13/10½	16/9	22/1½
£105	8/5	10/6	12/8	16/11	11/2	14/-	16/11	22/4
£106	8/6	10/7	12/9½	17/1	11/3	14/1½	17/1	22/6½
£107	8/6½	10/8½	12/10½	17/3	11/5	14/3	17/3	22/9
£108	8/7½	10/9½	13/-	17/5	11/6	14/5	17/5	22/11½
£109	8/8½	10/11	13/1½	17/7	11/7	14/6½	17/7	23/2½
£110	8/9½	11/-	13/3	17/9	11/8½	14/8	17/9	23/5
£111	8/10½	11/1	13/4½	17/11	11/10	14/9½	17/11	23/7½
£112	8/11½	11/2½	13/6	18/1	11/11	14/11	18/1	23/10
£113	9/0½	11/3½	13/7½	18/3	12/-	15/1	18/3	24/0½
£114	9/1½	11/5	13/9	18/5	12/1½	15/2½	18/5	24/3
£115	9/2½	11/6	13/10½	18/6½	12/3	15/4	18/6½	24/5½
£116	9/3½	11/7	13/11½	18/8½	12/4	15/5½	18/8½	24/8
£117	9/4½	11/8½	14/1	18/10½	12/5½	15/7	18/10½	24/10½
£118	9/5½	11/9½	14/2½	19/-	12/6½	15/9	19/-	25/1½

THIS TABLE IS NOT A PRICE LIST

TERNE PLATE

GENERAL.—Terne Plate sheets carry a tin-lead coating on a ductile steel base, and are used mainly for the production of canisters, where a tin-lead lining is essential. Terne Plate D.D. sheets are made from a deep drawing steel. The terne coating is toxic, and the sheets should not be used for the storage or handling of foodstuffs or drinking water.

WEIGHT PER SQUARE FOOT OF SHEET IN LBS.

28G	0.6394	20G	1.6012
26G	0.8020	18G	2.0015
24G	1.0121	16G	2.5319
22G	1.2769		

REGULARLY MANUFACTURED SIZES

Gauge	Nominal size Inches	Th. Sheet Weight	Sheet Count	Theoretical Weight
16G	x 36 x 72	46.13	49	1 0 0 20
16G	x 48 x 96	81.76	27	19 2 24
18G	x 36 x 72	36.47	61	19 3 13
18G	x 48 x 96	64.63	35	1 0 0 22
20G	x 36 x 72	29.17	77	1 0 0 6
20G	x 48 x 96	51.71	43	19 3 12
22G	x 36 x 72	23.26	96	19 3 21
24G	x 36 x 72	18.44	121	19 3 19
24G	x 37½ x 75¼	20.06	112	1 0 0 7
26G	x 36 x 96	19.44	115	19 3 24

PACKING.—All Terne Plate and Seconds are packed in one-ton galvanized skidded packs.

PACK MARKINGS.—Terne Plate packs are marked on one end with the quality and size. The other end carries the quality, gauge, number of sheets, and net weight. The packer's initials are marked on both sides.

Packs of Terne Plate Seconds are marked similarly, except in that the quality is marked as TERNE PLATE SECONDS and one corner of the pack is painted red.

LYSAGHT UNCOATED STEEL SHEET

BASIC STEEL TYPES

The properties exhibited by low carbon steels, from which the majority of our products are made, are determined by composition, steel type, and variation in the treatment of the flat rolled products. Composition is controlled by steel-making practice in the open hearth furnace, while steel types result from deoxidising and process control formulated for particular purposes.

The basic types of low carbon steel, which are of somewhat similar chemical composition, possess characteristics which are widely varying. In order to better understand the variations obtained by steel-making practice, a brief general description of our base types follows.

TYPICAL COMPOSITION

	C %	P %	Mn %	S %
Semi-killed steel	0.09	0.02	0.40	0.03
Capped steel	0.08	0.015	0.35	0.03
Rimmed steel	0.07	0.015	0.35	0.03
Fully-killed steel	0.05	0.01	0.30	0.02

These steels are listed in order of merit of formability. Semi-killed steel is the basis for commercial grades for general forming, while rimmed steel, in addition to drawability of a high order, possesses a base structure which allows the production of superior surface finishes. Fully-killed or stabilised steels are produced to meet extreme requirements in drawability, especially where stretch forming is involved. Capped steels possess characteristics intermediate between semi-killed and rimmed types.

CARBON AND SPECIAL STEELS

A range of carbon and special steels designed to meet specific strength, analysis and manufacturers' requirements is available.

The system of nomenclature is:—

1. HR, or CR, to indicate Hot Rolled or Cold Reduced.
2. A letter indicating the critical value or property,

followed by a number indicating the value to be met. These letters are:—

C. Nominal carbon content (carbon steels only).

Y. Yield point.

U. Ultimate strength.

E. Elongation.

For yield and ultimate strength the number following the letter will be the minimum value to be obtained in thousands of pounds per square inch. Elongation is on 2" gauge length.

3. A letter indicating the steel type.

R. Rimmed.

S. Semi-killed.

K. Killed.

4. A final suffix X if processing involves a departure from standard practice.

Example: HR.C65.S.

This is a hot rolled semi-killed steel of nominal carbon composition 0.65%.

STANDARD SURFACE FINISHES

There are six standard surface finishes listed below with their respective abbreviations and brief description of the quality. It should be noted that these various surface finishes cannot necessarily be obtained in each of the base types already described.

1. HOT ROLLED, HR.

Hot rolled qualities carry a tight layer of scale or oxide with a commercial surface finish, and are suitable for general use where the presence of scale is not objectionable.

Note.—If the scale or oxide is undesirable, the material can be supplied in a pickled and oiled condition.

2. HOT ROLLED PLANISHED, HR.PL.

When pickled hot rolled material is temper rolled, an improved surface finish is obtained. This finish is suitable for heavy-gauge material requiring a better surface than the previous grade.

3. COLD REDUCED BLACK, CR.BL.

This is a standard commercial quality carrying a light adherent oxide film. The surface is superior to that of hot rolled quality.

4. COLD REDUCED GENERAL PURPOSE, CR.GP.

Because of precautions taken during processing, this sheet is free from scale and oxide film. While the surface is clean, bright, and of good standard, it is not suitable for use as exterior panels.

5. COLD REDUCED FULL FINISH, CR.FF.

Full finish qualities are designed for use as exterior sections where a high surface standard is required (auto-mobile bodies, furniture, etc.). The surface is completely free from scale or oxide films.

6. COLD REDUCED SPECIAL SURFACE, CR.SS.

This is the finest standard surface finish produced, and is especially suited for high-quality exterior panels such as refrigerators, etc., where metal finishing is to be kept to a minimum.

INDIVIDUAL QUALITIES

The following chapter on individual qualities has, for the customer's convenience, been divided into six sections, namely:—1. Hot Rolled Qualities; 2. Cold Reduced Commercial Qualities; 3. Cold Reduced Deep Drawing Qualities; 4. Seconds and Mill Rejects; 5. Carbon Steels; 6. Special Steels.

Where coil can be supplied as an alternative to sheet, an indication is given in the description of the individual quality of the sizes which can be provided.

The information on the following pages of sizes available for each quality is correct at the date of printing. Because of changes in plant capacities and the installation of additional plant, the sizes and gauges available will vary.

If the sizes listed do not meet your requirements, you are invited to contact the Branch Office, where the latest information is available for all of Lysaght's products.

In the case of special sheets, examples of the typical qualities only are recorded to illustrate the range available. Customers are again invited to refer all requests for special steels to the respective Branch Offices for quotation.

HR. CQ.**HOT ROLLED COMMERCIAL
QUALITY**

GENERAL DESCRIPTION.—This is a standard heavy-gauge hot rolled sheet designed for the majority of commercial forming operations, but is not recommended for drawing operations or severe working. The surface of this grade carries an adherent layer of iron oxides.

TYPICAL USES.—Heavy-gauge drums, light structural members, shelving, formed angles, flats, etc.

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	48"-192" Maximum		
Width:	Gauge	Width	
	.059"-.061"	40" max.	
	.062"-.077"	42" "	Not yet available
	.078"-.091"	48" "	
	.092"-.104"	54" "	
	.105"-.125"	60" "	
Thickness:	.059"-.125"		

PACKING

	Cut length:	Coil:
Standard:	1 ton Bundle	
Optional:	2 and 3 ton Bundles 1 ton Skidded Packs 2 ton Skidded Packs 3 ton Skidded Packs	Not yet available

OPTIONAL EXTRA PROCESSING**Cut Length:**

Stretcher Levelled Flatness and/or Cropping
Resquaring

HR. P. CQ. | HOT ROLLED PICKLED COMMERCIAL QUALITY

GENERAL DESCRIPTION.—This is a standard heavy-gauge hot rolled sheet designed for the majority of commercial forming operations, but it is not recommended for drawing operations or severe working. It is similar to HR.CQ., but supplied in a pickled condition. The surface is free from scale or oxide film. The material is normally supplied oiled to prevent rusting in transit or in storage.

TYPICAL USES.—Formed structural members, railway carriage body panels, automotive brackets, and heavy electrical panels, etc.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	48"-150" Maximum			
Width:	Gauge	Width	Gauge	Width
	.059"-.061"	40" max.	.059"-.061"	18"-40" max.
	.062"-.077"	42" "	.062"-.077"	24"-42" "
	.078"-.091"	48" "	.078"-.091"	24"-48" "
	.092"-.104"	54" "	.092"-.104"	24"-54" "
	.105"-.125"	60" "	.105"-.125"	24"-60" "
			.126"-.160"	30"-36" "
			.161"-.180"	30"-60" "
Thickness:	.059"-.125"		.059"-.180"	

PACKING

	Cut length:	Coil:
Standard:	Skidded Pack, 2 tons	Sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded Pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut Length:	Coil:
Stretcher Levelled Flatness and/or Cropping	—
Resquaring	—

HR. DD. | HOT ROLLED DEEP DRAWING

GENERAL DESCRIPTION. — Hot Rolled Deep Drawing quality is a heavy-gauge sheet supplied in the pickled and oiled condition, the surface being free from scale or oxide film. The material is suitable for pressing or drawing operations too difficult for Commercial Quality. Sheets of this type are normally used for applications where appearance is not of primary importance.

TYPICAL USES.—Sealed unit housings, fence post caps, space heater bodies, automotive brake components, pulley wheels, shovel handles, etc.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	48"-150" Maximum			
Width:	Gauge	Width	Gauge	Width
	.075"-.077"	42" max.	.075"-.077"	24"-42" max.
	.078"-.091"	48" "	.078"-.091"	24"-48" "
	.092"-.104"	54" "	.092"-.104"	24"-54" "
	.105"-.125"	60" "	.105"-.125"	30"-60" "
Thickness:	.075"-.125"		.075"-.125"	

PACKING

	Cut length:	Coil:
Standard:	Skidded Pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded Pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:
Resquaring

Coil:
—

HR. EDD. | HOT ROLLED EXTRA DEEP DRAWING

GENERAL DESCRIPTION.—This quality is, by virtue of its special heat treatment, suited to particularly difficult pressings and drawing operations, beyond the range of HR.DD.

Because this sheet is recommended for use in the more difficult drawing operations, particular attention is given to its inspection to ensure that it is free from those surface defects which would be detrimental to drawability. The sheets are supplied oiled.

TYPICAL USES.—Sealed unit compressor pistons, heavy-gauge spinnings, deep drawn chassis components.

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	48"-150" Maximum		
Width:	Gauge	Width	
	.075"-.077"	42" max.	Not yet available
	.078"-.091"	48" "	
	.092"-.104"	54" "	
	.105"-.125"	60" "	
Thickness:	.075"-.125"		

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	
Optional:	Skidded pack, 1 ton or 3 tons	Not yet available

OPTIONAL EXTRA PROCESSING

Cut length:
Resquaring

HR. PL. EDD. | HOT ROLLED PLANISHED EXTRA DEEP DRAWING

GENERAL DESCRIPTION.—This is a heavy-gauge sheet with extra deep drawing properties, for applications for which surface finish is of importance both before and after drawing. In cases where electro-plating of 10 to 12 gauge is required, this quality is most suitable. Some treatment of the surface by buffing or polishing will be required. This material is supplied in an oiled condition.

TYPICAL USES.—Automotive bumper bar components, deep drawn machinery components.

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	48"-150" Maximum		
Width:	Gauge	Width	
	.075"-.077"	42" max.	Not yet available
	.078"-.091"	48" "	
	.092"-.104"	54" "	
	.105"-.125"	60" "	
Thickness:	.075"-.125"		

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Not yet available
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:
Stretcher Levelled Flatness
Resquaring

CR. BL. CQ. | COLD REDUCED BLACK COMMERCIAL QUALITY

GENERAL DESCRIPTION.—This is a commercial grade with a surface finish superior to hot rolled pickled quality, carrying a light adherent oxide film. The properties are such that the material may be formed by bending or folding operations, but it is not recommended for severe forming or drawing operations. This quality is supplied uncoiled unless otherwise specified.

TYPICAL USES.—Light-gauge drums, shelving, office furniture, and hollow ware.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	30"-180" Maximum			
Width:	Gauge	Width	Gauge	Width
	.015"-.016"	36" max.	.015"-.016"	18"-36" max.
	.017"-.019"	38" "	.017"-.019"	18"-38" "
	.020"-.034"	48" "	.020"-.034"	18"-48" "
	.035"-.096"	60" "	.035"-.062"	18"-60" "
	.097"-.112"	38" "		
Thickness:	.015"-.112		.015"-.062"	

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:	Coil:
Oiling	—
Stretcher Levelled Flatness and/or Cropping	—
Resquaring	—

CR. GP. CQ.

**COLD REDUCED GENERAL PURPOSE
COMMERCIAL QUALITY**

GENERAL DESCRIPTION. — This is a standard commercial grade sheet with a finish free from surface oxides or scale. The surface is clean, bright, and of good standard, and the properties are such that the material may be formed by bending or folding operations. This quality is supplied in an oiled condition.

For drawing operations, more severe forming, or where a better surface finish is required, other qualities are available.

TYPICAL USES. — Light-gauge drums, furniture, conduit, fluorescent light fittings, transformer bodies, omnibus bodies, and builders' hardware.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	30"-180" Maximum			
Width:	Gauge	Width	Gauge	Width
	.015"-.016"	36" max.	.015"-.016"	18"-36" max.
	.017"-.019"	38" "	.017"-.019"	18"-38" "
	.020"-.034"	48" "	.020"-.034"	18"-48" "
	.035"-.096"	60" "	.035"-.062"	18"-CJ" "
	.097"-.112"	38" "		
Thickness:	.015"-.112"		.015"-.062"	

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:

Blueing
Stretcher Levelled Flatness and/or Cropping
Resquaring

Coil:

—
—
—

CR. L. CQ. | COLD REDUCED LUSTRE COMMERCIAL QUALITY

GENERAL DESCRIPTION. — Cold Reduced Lustre Commercial Quality is a high-finish commercial quality manufactured primarily to minimise surface preparations of formed articles to be plated. The quality is not suitable for other than general forming and bending operations. This quality is produced with a smooth finish for special applications such as welded steel tubing (the smooth finish tends to reduce wear on forming rolls). The standard of surface finish is the same as for CR.GP.CQ., but the smooth finish may highlight minor surface imperfections which would not be visible through the shot-blast finish of the GP grade.

CR.L.CQ. is supplied only in coil form.

TYPICAL USES.—Welded steel tubing, venetian blind components, prepainted strip.

SIZE RANGE

Dimension:	Cut length:	Coil:	
Length:	Not available		
Width:		Gauge	Width
		.017"-.019"	18"-38" max.
		.020"-.034"	18"-48" "
		.035"-.062"	18"-60" "
Thickness:		.017"-.062"	

PACKING

	Cut length:	Coil:
Standard:	Not available	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:		—

OPTIONAL EXTRA PROCESSING

Coil:

—

CR. FF. CQ. | COLD REDUCED FULL FINISH COMMERCIAL QUALITY

GENERAL DESCRIPTION.—This is a commercial quality of high-grade surface appearance, and is suitable for forming into exterior panels. The properties are such that the material may be formed by bending or folding operations. For drawing operations, more severe forming, or where a better surface finish is required, other qualities are available.

The quality is supplied in an oiled condition.

TYPICAL USES.—Furniture and wall panels.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	30"-180" Maximum			
Width:	Gauge	Width	Gauge	Width
	.017"-.019"	38" max.	.017"-.019"	18"-38" max.
	.020"-.034"	48" "	.020"-.034"	18"-48" "
	.035"-.096"	60" "	.035"-.062"	18"-60" "
	.097"-.112"	38" "		
Thickness:	.017"-.112"		.017"-.062"	

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:	Coil:
Stretcher Levelled Flatness and/or Cropping	—
Resquaring	—

CR. GP. DD. | COLD REDUCED GENERAL PURPOSE DEEP DRAWING

GENERAL DESCRIPTION.—This is a standard sheet of high-grade deep drawing characteristics designed for all but the most severe drawing operations. The surface finish, which is free from oxide film, is suitable for applications where appearance both before and after drawing is of only secondary importance. This quality is supplied oiled unless otherwise specified on order.

TYPICAL USES. — Interior automotive panels, spinnings, radio and T.V. chassis, and general pressings.

SIZE RANGE

Dimension:	Cut lengths:		Coil:	
Length:	30"-180" Maximum			
Width:	Gauge	Width	Gauge	Width
	.017"-.019"	38" max.	.017"-.019"	18"-38" max.
	.020"-.030"	48" "	.020"-.034"	18"-48" "
	.031"-.062"	72" "	.035"-.062"	18"-60" "
	.063"-.096"	60" "		
	.097"-.112"	38" "		
Thickness:	.017"-.112"		.017"-.062"	

PACKING

	Cut lengths:	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:	Coil:
Resquaring	—

CR. NT. DD.**COLD REDUCED NOT TEMPER
ROLLED DEEP DRAWING**

GENERAL DESCRIPTION.—This quality is available for applications requiring added drawability and reduced tendencies to ageing. The material is supplied in a dead soft condition; it is not temper rolled, and therefore not subject to any flatness tolerance. The sheets are prone to stretcher straining, and are only recommended for use in applications where this is not objectionable.

TYPICAL USES.—Automotive floor panels and other un-exposed panels, general spinning operations.

SIZE RANGE

Dimension:	Cut lengths:		Coil:	
Length:	30"-180" Maximum			
Width:	Gauge	Width	Gauge	Width
	.020"-.030"	48" max.	.020"-.034"	18"-48" max.
	.031"-.062"	60" "	.035"-.062"	18"-60" "
	.063"-.096"	72" "		
	.097"-.112"	38" "		
Thickness:	.020"-.112"		.020"-.062"	

PACKING

	Cut lengths	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:
Steam blueing

Coil:
—

CR. BR. DD. | COLD REDUCED BRIGHT DEEP DRAWING

GENERAL DESCRIPTION. — Cold Reduced Bright Deep Drawing sheets have a smooth bright finish which reduces the amount of polishing necessary in the preparation of articles for electro-plating. The properties of this grade permit deep drawing operations to be carried out.

TYPICAL USES.— Automobile hub caps, domestic appliances and other electro-plated components.

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	30"-96" Maximum		Not available
Width:	Gauge	Width	
	.031"-.062"	48" max.	
Thickness:	.031"-.062"		

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Not available
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:

Stretcher Levelled Flatness and/or Cropping
Resquaring

CR. FF. DD. | COLD REDUCED FULL FINISH DEEP DRAWING

GENERAL DESCRIPTION.—This is a high-quality sheet combining good deep drawability with a high-quality surface finish. The physical properties of the sheet are such that it will meet all but the most severe applications, whilst the surface finish is ideal for exterior panels, excepting only the most critical requirements. This quality is supplied in an oiled condition.

TYPICAL USES. — Automotive exterior panels, vacuum cleaner bodies, air-conditioning equipment, metal doors.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	30"-180" Maximum			
Width:	Gauge	Width	Gauge	Width
	.020"-.030"	48" max.	.017"-.019"	18"-38" max.
	.031"-.062"	72" "	.020"-.034"	18"-48" "
	.063"-.096"	60" "	.035"-.062"	18"-60" "
	.097"-.112"	38" "		
Thickness:	.017"-.112"		.017"-.062"	

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:	Coil:
Stretcher Levelled Flatness and/or Cropping	—
Resquaring	—

CR. SS. DD. | COLD REDUCED SPECIAL SURFACE DEEP DRAWING

GENERAL DESCRIPTION.—This is the premium surface finish sheet, designed specifically for applications where final appearance is of paramount importance. The quality combines excellent drawability with the sheet surface free from defects which would necessitate metal re-working prior to the application of a coloured finish. The flatness of this quality sheet is equal to stretcher levelled flatness. This quality is supplied in an oiled condition.

TYPICAL USES.—Exterior panels for refrigerators and washing machines, household appliances, and T.V. cabinets.

SIZE RANGE

Dimension:	Cut length		Coil:
Length:	30"-192" Maximum		Not yet available
Width:	Gauge	Width	
	.020"-.034"	48" max.	
	.035"-.062"	60" "	
Thickness:	.020"-.062"		

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Not yet available
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING:

Cut length:

Resquaring

CR. FF. ST. | COLD REDUCED FULL FINISH STABILISED

GENERAL DESCRIPTION. — This quality is the premium drawing grade manufactured to meet extreme requirements of drawability. This material, which is rolled from fully killed steel, is not subject to strain ageing, the cause of the loss of ductility and tendency to stretcher strain which occurs when normal types of drawing qualities are held in stock for any length of time. This quality is supplied in an oiled condition.

The surface finish is suitable for exterior panels in all but the most critical appliances.

TYPICAL USES.— Automotive panels and components, petrol pump housings.

SIZE RANGE

Dimension:	Cut length:	Coil:
Length:	30"-180" Maximum	
Width:	Gauge	Width
	.031"	48" max.
	.034"	50" "
	.037"	54" "
	.041"-.062"	72" "
	.063"-.096"	60" "
	.097"-.112"	38" "
Thickness:	.031"-.112"	

Not available

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	
Optional:	Skidded pack, 1 ton or 3 tons	Not available

OPTIONAL EXTRA PROCESSING

Cut length:

SECONDS AND MILL REJECTS

Rigid inspection standards are applied in the manufacture of Lysaght Uncoated Sheets to ensure the maintenance of the high qualities of prime sheets. Resulting from the application of these stringent standards, some material is produced which falls outside the acceptable limits for primes, and is consequently classified as "Seconds" or "Mill Rejects." Seconds retain the quality name for which they were originally produced, e.g., CR.FF.DD. Seconds.

SECONDS. — Seconds must be within gauge, and must approximate closely the size for which they were originally rolled. Light edge defects are permissible, even though they may encroach on the nominal width of the sheet.

Surface defects within specified limits are classified as allowable for Seconds.

It is recommended that before a customer orders Seconds from surplus stock, the advice of our Technical Service Officers be sought regarding the suitability for the particular application.

MILL REJECTS.—This quality is available from surplus stock.



O R B

TRADE MARK

CARBON STEELS

Where higher tensile strength is required than that of Commercial Quality Sheets, steels of greater carbon content are used. A range of qualities is available to meet specific requirements.

HR. C15. R.

GENERAL DESCRIPTION.—This is a drawable rimmed grade steel supplied in a hot rolled pickled finish. The increased carbon content imparts extra strength, making the quality suitable for shallow pressing where some increase in strength is desired. This quality is supplied in an oiled condition unless otherwise stated.

TYPICAL USES.—Automobile wheel centres and similar applications.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	48"-150" Maximum			
Width:	Gauge	Width	Gauge	Width
	.075"-.077"	42" max.	.075"-.077"	24"-42" max.
	.078"-.091"	48" "	.078"-.091"	24"-48" "
	.092"-.104"	54" "	.092"-.104"	24"-54" "
	.105"-.187"	60" "	.105"-.160"	30"-60" "
Thickness:			.161"-.180"	30"-36" "
	.075"-.187"		.075"-.180"	

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:
Resquaring

Coil:
—

HR. C20. S.

GENERAL DESCRIPTION.— This is a hot rolled semi-killed carbon steel with a nominal carbon content of 0.2%. The material is supplied in the pickled and oiled condition unless otherwise stated.

The physical properties of this grade, which is of greater mechanical strength than standard commercial quality, are such that the material is suitable for commercial forming and bending operations, but it is not recommended for drawing or pressing.

TYPICAL USES. — Automobile chassis frames and components.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	48"-150" Maximum			
Width:	Gauge	Width	Gauge	Width
	.075"-.078"	48" max.	.075"-.078"	24"-48" max.
	.079"-.099"	54" "	.079"-.099"	24"-54" "
	.100"-.187"	60" "	.100"-.160"	30"-60" "
			.161"-.180"	30"-36" "
Thickness:	.075"-.187"		.075"-.180"	

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:	Coil:
Resquaring	—

CR. C20. S.

GENERAL DESCRIPTION.—For 11-gauge sheet and lighter in the nominal 0.2% carbon grade, this quality is supplied in the cold reduced commercial quality finish, which is free from surface scale and oxide. This material is supplied in an oiled condition.

The physical properties are basically the same as HR.C20.S.

TYPICAL USES. — Lightweight moulds and structural members.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	30"-180" Maximum			
Width:	Gauge	Width	Gauge	Width
	.031"-.039"	48" max.	.031"-.039"	48" max.
	.040"-.096"	54" "	.040"-.062"	54" "
	.097"-.112"	38" "		
Thickness:	.031"-.112"		.031"-.062"	

PACKING

	Cut Length:	Coil:
Standard:	Skidded pack, 2 tons	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:
Resquaring

Coil:
—

HR. C30. S.

GENERAL DESCRIPTION.—This quality is a semi-killed carbon steel of nominal carbon content of 0.30%. The sheets are supplied in a hot rolled mill-finished condition. The physical properties are designed for greater strength and stiffness of product while retaining limited forming ability. This quality is available in 20 gauge and heavier.

TYPICAL USES.—Light structural members.

SIZE RANGE

Dimension:	Cut length:		Coil:	
Length:	48"-192" Maximum			
Width:	Gauge	Width	Gauge	Width
	.039"-.062"	42" max.	.075"-.160"	30"-48" max.
	.063"-.187"	48" ..	.161"-.180"	30"-36" ..
Thickness:	.039"-.187"		.075"-.180"	

PACKING

	Cut length:	Coil:
Standard:	1-ton bundle	Paper and sheet steel wrapped, on skids, 3½-4 tons
Optional:	2-ton bundles Skidded pack, 1 ton or 3 tons	

OPTIONAL EXTRA PROCESSING

Cut length:

Annealing
 †Pickling
 Oiling
 Stretcher Levelled Flatness
 Cropping
 Resquaring

Coil:

Annealing
 Pickling
 Oiling

†Pickling and Oiling is applicable to sheets 150" maximum only.

HR. C65. S.

GENERAL DESCRIPTION.—This is a semi-killed carbon steel of 0.65% nominal carbon content. The quality is primarily designed as an economical general purpose high carbon steel for uses in applications where subsequent heat treatment is necessary.

A Technical Note covering details of recommended heat treatment procedures is available on application.

Nominal composition and physical properties:—

C.—0.6%, P.—0.03%, Mn.—0.75%,

Si.—Residual, S.—0.04%.

Open Hearth Semi-Killed.

Ultimate Tensile Strength: Brinell Hardness:

As rolled .. 110,000-135,000 p.s.i. 220-270

Annealed .. 90,000-110,000 p.s.i. 180-230

TYPICAL USES.—Shovels, plough discs, and miscellaneous hard-wearing or cutting edges.

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	72"-96" Maximum		Not available
Width:	Gauge	Width	
	.049"-.061"	36" max.	
	.062"-.077"	40" "	
	.078"-.187"*	48" "	
Thickness:	.049"-.187"		

PACKING

	Cut length:	Coil:
Standard:	1-ton bundle	Not available
Optional:	2-ton bundles	
	Skidded packs, 1 ton, 2 or 3 tons	

*Over .156", maximum length available is 78".

OPTIONAL EXTRA PROCESSING

Cut length:

Annealing
Pickling

Oiling
Cropping

Resquaring

SPECIAL STEELS

Because of limited use and specific application, certain grades are classified as Special Steels. It is the aim of the Company to meet the country's needs in the sheet steel field, and it is the policy to develop new qualities of plain carbon or low alloy steels to meet Trade requirements.

Enquiries are welcomed for steels, the uses of which are not covered by steels listed in this brochure.

L.P.G.C. | LIQUEFIABLE PETROLEUM GAS CYLINDER STEEL

GENERAL DESCRIPTION.—This is a special low alloy steel of the weldable type, possessing high strength characteristics in the normalised condition. It is specially produced to meet the requirements of Australian Standard Specification B.115-1958 for liquefiable petroleum gas cylinders.

It is supplied in the spheroidised annealed condition, pickled and oiled in order to permit easy fabrication, as required by the Australian Standard Specification. It must be finally heat treated by the customer to produce the necessary physical properties.

Typical composition and steel type:

C.—0.17%, P.—0.03%, Mn.—1.4%,

Si.—0.3%, S.—0.04%.

Fully killed, hot topped.

PHYSICAL PROPERTIES.—After a suitable heat treatment cycle, specified on the certificate accompanying each delivery, the material will meet the requirements of Australian Standard Specification B.115-1958.

Ultimate tensile strength	70,000 p.s.i. minimum
Yield Point	40,000 p.s.i. minimum
Elongation	20% minimum on 2"

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	48"-150" Maximum		Not available
Width:	Gauge	Width	
	.088"-.134"	48" max.	
Thickness:	.088"-.134"		

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons.	Not available
Optional:	Skidded pack, 1 ton or 3 tons.	

BRANDING. Individual cut lengths are branded with stock card number, this and the relevant heat number being found on all certificates. Heats are normally packed and despatched as a complete run.

OPTIONAL EXTRA PROCESSING

Cut length:
Resquaring

HR. Y45. M.K. AND HR. Y50. M.K.

GENERAL DESCRIPTION. — Hot rolled low alloy high tensile steels are manufactured for those applications where the use of high-strength materials permits the manufacturer to make worthwhile reductions in weight. A particular advantage of these qualities is that they are weldable under normal conditions without loss of strength. HR.Y45.M.K. is supplied in the "Pearlitic" condition in the gauge range of 14-16 B.G., while HR.Y50.M.K. is supplied in the "Pearlitic" condition in the 10-12 B.G. range.

A Technical Note is available covering welding and other techniques applicable to these qualities.

PHYSICAL PROPERTIES.—		Yield Strength:	Elongation:
HR.Y45.M.K.		45,000 p.s.i. min.	20% min. on 2"
HR.Y50.M.K.		50,000 p.s.i. min.	20% min. on 2"

TYPICAL USES.—Transport frames and bodies, general lightweight fabrication.

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	48"-150" Maximum		Not available
Width:	Gauge	Width	
HR.Y45.M.K.	.088"-.134"	48" max.	
HR.Y50.M.K.	.088"-.134"	48" ..	
Thickness:			
HR.Y45.M.K.	.088"-.134"		
HR.Y50.M.K.	.088"-.134"		

PACKING

	Cut length:	Coil:
Standard:	1-ton bundle.	Not available
Optional:	2-ton bundle.	
	Skidded pack, 1 ton, 2 or 3 tons.	

OPTIONAL EXTRA PROCESSING

Cut length:		
Resquaring	Oiling	Pickling

ENAMELLING QUALITY

GENERAL DESCRIPTION. — This quality, because of its chemical composition and the special processing given, provides the ideal base for the application of porcelain enamels. Its freedom from distortion at enamelling temperatures makes it particularly satisfactory for the production of large flat enamel panels.

Enamelling quality possesses good drawability, and it is capable of making all but the most severe draws.

TYPICAL USES.—Kitchen utensils, domestic appliances, and hospital ware.

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	30"-150" Maximum		Not available
Width:	Gauge	Width	
	.020"-.034"	48" max.	
	.035"-.087"	58" "	
Thickness:	.020"-.087"		

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons.	Not available
Optional:	Skidded pack, 1 ton or 3 tons.	

OPTIONAL EXTRA PROCESSING

Cut length:
Stretcher Levelled Flatness and/or Cropping
Resquaring

TACK PLATE

GENERAL DESCRIPTION.—This quality is specially produced to meet the requirements of the tack-making trade. This material is provided in the hot rolled pickled condition in the gauge range from .072" to .125", and as cold reduced sheet in the range from .042" to .062". Tack plate is supplied oiled or unoiled as specified.

SIZE RANGE

Dimension:	Cut length:		Coil:
Length:	30"-150" Maximum		
Width:	Gauge	Width	
Hot Rolled	.072"-.077"	42" max.	Not available
	.078"-.091"	48" "	
	.092"-.104"	54" "	
	.105"-.125"	60" "	
Cold Reduced	.042"-.062"	60" "	
Thickness:			
Hot Rolled	.072"-.125"		
Cold Reduced	.042"-.062"		

PACKING

	Cut length:	Coil:
Standard:	Skidded pack, 2 tons.	Not available
Optional:	Skidded pack, 1 ton or 3 tons.	

OPTIONAL EXTRA PROCESSING

Cut length:
Resquaring

BIRMINGHAM GAUGE

The standard gauge table used for Black Steel Sheets is known as the Birmingham Gauge, or B.G. It must not be confused with either the Birmingham Wire Gauge (B.W.G.) or the Standard Wire Gauge (S.W.G.). Wherever the word gauge is used in these pages the Birmingham Gauge is implied.

It is useful to remember that—

10G (B.G.) is 1/8" thick

16G (B.G.) is 1/16" thick

and that for every increase of 6 in the number of the gauge the thickness of the sheet is reduced by a half.

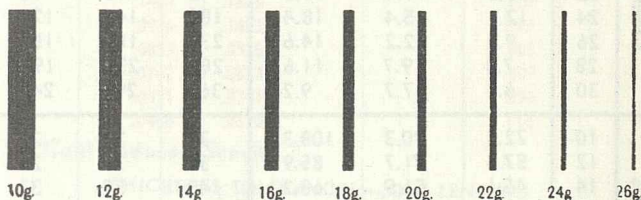


Illustration showing the approximate thickness of sheets according to the Birmingham Gauge.

GAUGE TABLE

Gauge	Thickness		lbs. per sq. ft.	Gauge	Thickness		lbs. per sq. ft.
	Ins.	Mms.			Ins.	Mms.	
8	.157	3.988	6.41	20	.039	.996	1.60
9	.140	3.551	5.70	21	.035	.886	1.42
10	.125	3.175	5.10	22	.031	.794	1.27
11	.111	2.827	4.54	23	.028	.707	1.13
12	.099	2.517	4.04	24	.025	.629	1.01
13	.088	2.240	3.60	25	.022	.560	.90
14	.078	1.994	3.20	26	.020	.498	.80
15	.070	1.775	2.85	27	.0175	.443	.71
16	.062	1.587	2.55	28	.0155	.396	.64
17	.056	1.412	2.27	29	.0140	.353	.57
18	.049	1.257	2.02	30	.0125	.312	.50
19	.044	1.118	1.80				

BLACK STEEL SHEET

	Gauge	APPROXIMATE WEIGHT PER SHEET—LBS.			COUNT OF SHEETS PER TON		
		Width			Width		
		24"	30"	36"	24"	30"	36"
6-FOOT LENGTHS	10	62.1	77.5	92.9	36	29	24
	12	49.3	61.8	73.7	46	36	30
	14	39.1	48.8	58.5	57	46	38
	16	31.0	38.7	46.5	72	58	48
	18	24.6	30.8	36.9	91	73	61
	20	19.5	24.4	29.3	115	92	77
	22	15.5	19.4	23.2	142	116	96
	24	12.3	15.4	18.4	182	146	122
	26	9.8	12.2	14.6	230	184	154
	28	7.8	9.7	11.6	289	231	193
	30	6.2	7.7	9.2	367	294	245
7-FOOT LENGTHS	10	72.3	90.3	108.3	31	25	21
	12	57.4	71.7	85.9	39	31	26
	14	45.6	56.9	68.2	49	39	33
	16	36.2	45.1	54.1	62	50	41
	18	28.7	35.0	43.0	78	63	52
	20	22.8	28.4	34.1	99	79	66
	22	18.1	22.6	27.0	124	99	83
	24	14.3	17.9	21.5	156	125	104
	26	11.4	14.2	17.0	197	158	132
	28	9.0	11.3	13.5	248	198	166
	30	7.2	9.0	10.7	315	252	110
8-FOOT LENGTHS	10	82.6	103.1	123.6	27	22	18
	12	65.5	81.8	98.1	34	27	23
	14	52.0	64.9	77.9	43	35	29
	16	41.3	51.5	61.8	54	43	36
	18	32.8	40.9	49.1	69	55	46
	20	26.0	32.5	38.9	87	69	58
	22	20.6	25.8	30.9	105	87	72
	24	16.4	20.5	24.5	137	110	91
	26	13.0	16.2	19.5	173	138	115
	28	10.3	12.9	15.5	217	174	145
	30	8.2	10.2	12.3	276	221	184

ERRATA SHEET (Page No. 57.)

(a) Hot Rolled Sheets:

THICKNESS TOLERANCES — CUT LENGTHS

CATEGORY "OVER 32 TO 40 INCL." SHOULD READ

Specified Thickness Tolerances Plus or Minus, Inch	Over 32 to 40 incl.
.1484 to .1875	.009
.0936 to .1483	.009
.0833 to .0935	.008
.0742 to .0832	.007
.0591 to .0741	.006
.0468 to .0590	.006

DIMENSIONAL TOLERANCES — CUT LENGTHS

1. **GAUGE.**—The following tables give the tolerances permitted by the trade in uncoated sheet, both in the hot rolled and cold reduced form.

(a) Hot Rolled Sheets:**THICKNESS TOLERANCES — CUT LENGTHS**

Specified Thickness Tolerances Plus or Minus, Inch	Specified Width, Inches			
	24 to 32 incl.	Over 32 to 40 incl.	Over 40 to 48 incl.	Over 48 to 60 incl.
.1484 to .1875	.009	.006	.010	.010
.0936 to .1483	.008	.006	.010	.010
.0833 to .0935	.007	.007	.008	.008
.0742 to .0832	.007	.008	.007	—
.0591 to .0741	.006	.009	.006	—
.0468 to .0590	.005	.009	—	—

(b) Cold Reduced Sheets:**THICKNESS TOLERANCES — CUT LENGTHS**

Thickness Tolerances for specified widths and thicknesses Over and under Inch	Specified Width, Inches				
	24 to 32 incl.	Over 32 to 40 incl.	Over 40 to 48 incl.	Over 48 to 60 incl.	Over 60 to 72 incl.
.0742 to .0833 ..	.006	.006	.006	.007	—
.0591 to .0741 ..	.005	.005	.005	.006	.006
.0526 to .0590 ..	.005	.005	.005	.006	.006
.0468 to .0525 ..	.004	.004	.004	.004	.005
.0370 to .0467 ..	.004	.004	.004	.004	.005
.0295 to .0369 ..	.003	.0035	.0035	.0035	.004
.0263 to .0294 ..	.003	.003	.003	.0035	—
.0208 to .0262 ..	.003	.003	.003	.003	—
.0147 to .0207 ..	.002	.002	.002	—	—
.0116 to .0146 ..	.002	.002	—	—	—
.0115 and thinner	.0015	.0015	—	—	—

2. **LENGTH.**—For material as rolled and not resquared, the tolerance on length is:

$$-0 + 1\frac{1}{2}\% \text{ of the length.}$$

3. **WIDTH.**—For material as rolled and not resquared, the width tolerances are:—

Up to 48" wide	-0 + $\frac{1}{4}$ "
Over 48" wide	-0 + $\frac{3}{8}$ "

4. **CAMBER.**—The cut lengths supplied are such that a sheet of nominal size can be cut from it.

5. **OUT OF SQUARE.**—The cut lengths supplied are such that a sheet of nominal size can be cut from it.

6. **FLATNESS.** — Flatness tolerances for cut lengths not specified to stretcher levelled standard of flatness are:—

Ordered width	Maximum height of buckles
36" or under	$\frac{3}{4}$ "
Over 36" to 48"	1"
Over 48" to 60"	1 $\frac{1}{4}$ "
Over 60"	1 $\frac{1}{2}$ "

FLATNESS TOLERANCES—STRETCHER LEVELLED FLATNESS:

Gauge	Width	Tolerance Max. deviation from horizontal flat surface
Over .031"	To 48" incl.	$\frac{1}{8}$ "
	Over 48"	$\frac{1}{4}$ "
.030"-.025"	To 36" incl.	$\frac{1}{4}$ "
	Over 36" to 48"	$\frac{3}{8}$ "
.024"-.020"	To 36" incl.	$\frac{3}{8}$ "
	Over 36" to 48"	$\frac{1}{2}$ "

7. **RESQUARED WIDTH AND LENGTH.**—

Up to 48" wide and 120" long	-0 +1/16"
Over 48" wide and 120" long	-0 +1/8"

DIMENSIONAL TOLERANCES — COIL

1. **GAUGE.**— The following tables give the permissible gauge tolerances applicable to uncoated hot rolled and cold reduced material in coil form. In conformity with established practice, these tolerances do not apply in the immediate vicinity of any weld in the coil, where some out-of-gauge material may be found.

(a) Hot Rolled Coil:

THICKNESS TOLERANCES

Specified Thickness Tolerances Plus or Minus, Inch	Specified Width, Inches			
	24 to 32 incl.	Over 32 to 40 incl.	Over 40 to 48 incl.	Over 48 to 60 incl.
.1484 to .1875	.009	.009	.010	.010
.0936 to .1483	.008	.009	.010	.010
.0833 to .0935	.007	.008	.008	—
.0742 to .0832	.007	.007	.007	—
.0591 to .0741	.006	.006	.006	—
.0468 to .0590	.005	.006	—	—

(b) Cold Reduced Coil:

THICKNESS TOLERANCES

Thickness Tolerances for specified widths and thicknesses Over and Under Inch	Specified Width, Inches				
	24 to 32 incl.	Over 32 to 40 incl.	Over 40 to 48 incl.	Over 48 to 60 incl.	Over 60 to 72 incl.
.0742 to .0833 ..	.006	.006	.006	.007	—
.0591 to .0741 ..	.005	.005	.005	.006	.006
.0526 to .0590 ..	.005	.005	.005	.006	.006
.0468 to .0525 ..	.004	.004	.004	.004	.005
.0370 to .0467 ..	.004	.004	.004	.004	.005
.0295 to .0369 ..	.003	.0035	.0035	.0035	.004
.0263 to .0294 ..	.003	.003	.003	.0035	—
.0208 to .0262 ..	.003	.003	.003	.003	—
.0147 to .0207 ..	.002	.002	.002	—	—
.0116 to .0146 ..	.002	.002	—	—	—
.0115 and thinner ..	.0015	.0015	—	—	—

2. **WIDTH.**— For material as rolled, width tolerances are:—

Up to 48" wide -0 +1/4"

Over 48" wide -0 +3/8"

3. **CAMBER.**— Camber does not exceed 1 inch in 20 feet.

4. FLATNESS.—Sheets shipped in cut lengths conform to flatness tolerances because the producer can inspect for flatness and perform corrective operations when necessary. There is no practical way to judge the flatness of material in coil form, either in the coil or as it is being wound under tension. The lack of flatness in coils may be due to buckles, wavy edges, coil set or other conditions which are corrected by supplementary operations when producing cut lengths. To assure the desired flatness of sheets cut from coils, the user should perform corrective flattening measures. When equipment comparable to that used by the producer is correctly employed, the flatness limits for cut length sheets should be obtained. Coils may contain portions which do not respond satisfactorily to ordinary flattening operations.

The flatness of sheets or strip which have been slit from a multiple-width coil is not necessarily related to the flatness of the parent multiple-width coil.

Items that require stretcher-levelled standard of flatness should be so specified, and are supplied in cut lengths only.

5. RESQUARED WIDTH.—

Up to 48" wide	..	..	-0 +1/16"
Over 48" wide	..	..	-0 +1/8"

ORDERING

To enable us to ensure that sheets are delivered at the required time, and to allow us to use our manufacturing capacity to its fullest extent, long-range programming is essential.

We have found it necessary to plan overall production for at least six months in advance, not only to achieve the objectives set out above, but also to take care of those occasional delays that can never be wholly avoided. The many steps that are involved in the production of sheets make it necessary for us to take the initial steps in the fulfilment of an order at least three months before it is due for delivery.

In particular cases, and for standard lines, a shorter period may be possible for some of our production, but the basic requirements of sufficient notice exist for co-ordinated and economical operation.

From the customer's viewpoint, a short delivery time is an asset. However, apart from stock lines, there is an inevitable processing delay calling for ordering in advance, and we must request that orders be placed for one month's supply, allowing for three to four months' delivery. For example, orders for delivery in January should be placed with Branch Offices by September 20, and so on. At the same time, we would like to have a forecast of the probable requirements for the whole of the quarter when the orders for the first month of a quarter are placed.

With this co-operation, the smooth, regular flow of material will be facilitated.

DIMENSIONS.—For gauge ranges applicable to particular grades, refer to the individual quality. Any order calling for a length, width or gauge which is not regularly manufactured is subject to a minimum quantity of 15 tons.

Standard gauges are the even Birmingham Gauge numbers. Standard widths are 30, 36, 42 and 48 inches, and standard lengths are 72, 84 and 96 inches for sheet material. In respect to material supplied in coil form, the standard weight is $3\frac{1}{2}$ -4 tons.

Lengths and widths which are not standard should be compatible with the shearing tolerance which applies to the particular quality concerned.

QUALITY.—It is sufficient if the quality is defined under the abbreviated name. (Example: HR.CQ. for Hot Rolled Commercial Quality.)

PACKING WEIGHT.—This should be in accordance with the standard packing weight shown for the particular quality. This applies to material in both sheet and coil form. Coil weights outside the standard specified are available by negotiation.

PURPOSE.—The specific purpose for which it is intended to use the material should be stated on all orders. In the case of initial orders, a sketch, blue print or sample of the product should accompany the order, together with an indication of the proposed method of manufacture. Special mention should be made of any particular requirements in the final product.

EXTRAS.—The extras available for each quality are shown in the individual descriptions. Those selected should be stated on the order.

DATE OF DELIVERY.—The month in which delivery is required should be specified on the order.

POINT OF DELIVERY.—This should be specified on the order.

SECONDS AND MILL REJECTS

SECONDS.—If a customer so desires, Seconds arising from the processing of an order may be included for delivery by arrangement with the customer. In many applications the customer will find it advantageous to accept Seconds arising, especially for fabrication where a small amount of re-work is a normal process. Any Seconds included are priced accordingly.

Seconds may also be purchased separately, when available, as surplus stock items.

MILL REJECTS.—This quality is available from surplus stock.



O R B

TRADE MARK

NOTES ON PACKING

The following information has been included for reference on the methods of packing used.

SHEET.—The standard method of packing used for all Cold Reduced and Hot Rolled Pickled and Oiled material is the skidded pack. This is produced by first enclosing the sheets in a steel envelope. The envelope is placed on a wooden framework which consists of longitudinal skids extending the full length of the pack; transverse cross members serve to space the skids and raise the pack from the ground. The envelope is bound to the framework by steel straps which pass around the transverse members. There are a number of definite advantages in this form of packing. The steel sheet envelopes not only protect the contents during transit and storage, but may themselves be used for working-up purposes when empty. The wooden framework gives excellent protection to edges and corners, but, in addition, facilitates handling by slings or fork-lift trucks, and allows tidy stacking. When the pack has been removed, the timber, being of substantial section, may be found of use for dunnage or other purposes.

In the case of Hot Rolled Unpickled qualities, these are normally supplied in unwrapped bundles with longitudinal and transverse steel strapping. However, the skidded pack is available as an optional extra.

IDENTIFICATION MARKINGS.—All individual sheets are branded with the quality of material, the stock card number, and the year of manufacture.

In addition to the above information, all sheet packs carry the following stencilled information:—

Customer's Name.
Destination.
Grade of Material.
Gauge and size.

Number of sheets.
Nett weight.
Crate number.
Order number.

The various packing methods are summarised in the table below:—

Material:	Pack:	Weight:
Cold Reduced All qualities and Seconds	Standard skidded pack	2 tons
	Optional skidded pack	1 or 3 tons
Pickled and Oiled All qualities and Seconds	Standard skidded pack	2 tons
	Optional skidded pack	1 or 3 tons
Hot Rolled—un- pickled All qualities includ- ing Carbon Steel and Seconds	Standard bundle	1 ton
	Optional bundle	2 tons
	Optional skidded pack	1, 2 or 3 tons
Mill Rejects	Skidded pack	1 ton
	Optional bundle	1 ton

COIL.—The table below lists the packing methods used for coil:—

Material:	Pack:	Weight:
Hot Rolled	Paper wrapped	3½-4 tons
Hot Rolled Pickled	Paper and steel wrapped and strapped to skidded wooden frame	3½-4 tons
Cold Reduced	Paper and steel wrapped and strapped to skidded wooden frame	3½-4 tons

IDENTIFICATION MARKINGS.—The outside wraps of each are branded with the quality of material and coil identification number.

All coil packs carry the following information:—

Customer's name.	Gauge and size.
Packing number.	Nett tonnage.
Grade of material.	Order number.

TECHNICAL SERVICE

Should any difficulty arise in the processing of our material or for any other cause, please contact your local Branch office. It would be of the greatest assistance in this respect if the following details could be provided:—

Quality.	Count.
Gauge.	Quantity of material involved.
Size.	Pack or bundle number.
Weight.	Numbers branded on the sheets.

The particular purpose for which the material is being used and exact nature of the difficulty being experienced would also be of assistance. Should it be suspected that the material is not of the correct quality or standard, production should cease on this particular material pending investigation by our Technical Representative; otherwise, as indicated in Trade Customs, liability cannot necessarily be accepted.



O R B

TRADE MARK

BLACK STEEL SHEETS**Comparison of Sheet and Wire Gauges**

Gauge Name	Birmingham Gauge (B.G.)	U.S. Mnfrs. Standard Gauge	Birmingham Wire Gauge (Stubs') (B.W.G.)	Imperial Standard (British) (I.S.W.G.)	U.S. Steel Wire Gauge	Browne & Sharpe Gauge (American)
Principal Use	Steel Sheets, etc.	Steel Sheets, etc.	Steel Wire, Shts., etc.	Steel Wire, Shts., etc.	Steel Wire	Non-ferrous Sheets, Wire, etc.

Gge. No. Thickness or Diameter in Inches

4/0	.5416	—	.454	.400	.3938	.4600
3/0	.5000	—	.425	.372	.3625	.4096
2/0	.4452	—	.380	.348	.3310	.3648
0	.3964	—	.340	.324	.3065	.3249
1	.3532	—	.300	.300	.2830	.2893
2	.3147	—	.284	.276	.2625	.2576
3	.2804	.2391	.259	.252	.2437	.2294
4	.2500	.2242	.238	.232	.2253	.2043
5	.2225	.2092	.220	.212	.2070	.1819
6	.1981	.1943	.203	.192	.1920	.1620
7	.1764	.1793	.180	.176	.1770	.1443
8	.1570	.1644	.165	.160	.1620	.1285
9	.1398	.1495	.148	.144	.1483	.1144
10	.1250	.1345	.134	.128	.1350	.1019
11	.1113	.1196	.120	.116	.1205	.0907
12	.0991	.1046	.109	.104	.1055	.0808
13	.0882	.0897	.095	.092	.0915	.0720
14	.0785	.0747	.083	.080	.0800	.0641
15	.0699	.0673	.072	.072	.0720	.0571
16	.0625	.0598	.065	.064	.0625	.0508
17	.0556	.0538	.058	.056	.0540	.0453
18	.0495	.0478	.049	.048	.0475	.0403
19	.0440	.0418	.042	.040	.0410	.0359
20	.0392	.0359	.035	.036	.0348	.0320
21	.0349	.0329	.032	.032	.0317	.0285
22	.0312	.0299	.028	.028	.0286	.0253
23	.0278	.0269	.025	.024	.0258	.0226
24	.0247	.0239	.022	.022	.0230	.0201
25	.0220	.0209	.020	.020	.0204	.0179
26	.0196	.0179	.018	.018	.0181	.0159
27	.0174	.0164	.016	.0164	.0173	.0142
28	.0156	.0149	.014	.0148	.0162	.0126
29	.0139	.0135	.013	.0136	.0150	.0113
30	.0123	.0120	.012	.0124	.0140	.0100
31	.0110	.0105	.010	.0116	.0132	.00893
32	.0098	.0097	.009	.0108	.0128	.00795
33	.0087	.0090	.008	.0100	.0118	.00708
34	.0077	.0082	.007	.0092	.0104	.00630
35	.0069	.0075	.005	.0084	.0095	.00561
36	.0061	.0067	.004	.0076	.0090	.00500

ELECTRICAL STEELS

GENERAL.—The steel core components of motors, alternators, and transformers are made up of high-quality special sheet steel laminations. Stringent control of raw materials and steel processing is maintained.

A catalogue, "Lysaght Electrical Steels," is available, and provides details of magnetic and physical characteristics of the various grades produced. Briefly, the STALLOY Grades are used for transformer work and other applications where low electrical losses are essential. MOTOR 100, MEDIUM RESISTANCE, and SPECIAL LOHYS are used for motors of all types, large motor-generators, small transformers, and reactors. The SPECIAL LOW SILICON grade finds use in applications where the magnetic properties of the core steel are less critical. Sheets in a range of thicknesses are available and, to assist manufacturers in the production of laminations, all Electrical Steel grades are available in the form of coiled strip. Sheets are precision welded by a technique which has been developed to produce a weld which is not appreciably thicker than the sheet, and the weld is therefore capable of being included in the assembled cores.

Electrical Steel sheets and coils are available in a variety of surface finishes, depending primarily on the degree of inter-lamination resistance required.

ELECTRICAL STEEL DATA

Quality	Thick- ness	Core Losses at 50 Cycles			
		Guar. Max. Loss B=10,000 gauss		Approx. equivalent	
		W./lb.	W./Kg.	B=13,000 W./Kg.	B=15,000 W./Kg.
Stalloy 90	.014"	.41	0.90	1.57	2.12
Stalloy 95	.014"	.43	0.95	1.65	2.25
Stalloy 100	.014"	.455	1.00	1.74	2.35
Stalloy 105	.014"	.475	1.05	1.80	2.47
Stalloy 110	.014"	.50	1.10	1.87	2.55
Stalloy 120	.014"	.54	1.20	2.02	2.80
Stalloy 130	.014"	.59	1.30	2.20	3.10
Stalloy 140	.014"	.63	1.40	2.35	3.50
Stalloy 150	.014"	.68	1.50	2.52	3.75
Stalloy 120	.020"	.63	1.39	2.36	3.56
Stalloy 130	.020"	.68	1.50	2.55	3.84
Stalloy 140	.020"	.74	1.63	2.77	4.17
Stalloy 150	.020"	.81	1.78	3.04	4.55
Motor 100	.020"	1.00	2.20	3.66	5.30
Motor 100	.025"	1.12	2.47	4.20	5.95
Med. Resistance	.020"	1.14	2.51	4.18	6.00
Med. Resistance	.025"	1.29	2.84	4.72	6.78
Special Lohys	.018"	1.23	2.71	4.60	6.60
Spec. Low Silicon*	.025"	1.9	4.2	7.0	10.0
Spec. Low Silicon*	.031"	2.4	5.3	8.8	13.0

*Typical properties after suitable heat treatment.

GLOSSARY OF TERMS

A number of terms peculiar to the steel industry are used in our price list and in reports which are frequently circulated. Other terms which are in more common use are included in a list of definitions.

ANNEALING.—Annealing is a process of heat treatment designed for improving the ductility and general properties of sheet steel. The process consists of heating to, and holding at a suitable temperature, and then cooling at a suitable rate. Variations of the practice which are used and referred to by more specific terms are as follows:

Blue Annealing

Bright Annealing

Spheroidising

and, in some cases, Stress Relief Annealing.

BLUEING.—Blueing is a process of carefully controlled oxidation which imparts an adherent film of iron oxide over the whole surface of the sheet. The oxide is blue in colour, and from this the process gets its name.

CAMBER.—Camber is the term used to designate the horizontal edge curvature in a cut length or in a specific length of coil. This curvature must be measured in a flat position in the same plane as the sheet.

COLD FORMING.—Cold forming is a broad term used to describe metal-forming operations which are carried out at either atmospheric or very slightly elevated temperature.

COMMERCIAL FLATNESS. — Commercial flatness is the normal standard of flatness to which sheets are supplied, and this is usually achieved by roller levelling.

CROPPING. — Cropping is the term generally used to denote the end shearing operation which follows stretcher levelling, when the grip marks are to be removed.

DUCTILITY.— Ductility is a property of metals which enables them to undergo plastic deformation. Ductile metals can be deformed to a greater extent, prior to fracture, than non-ductile metals.

DRAWABILITY.— Drawability is a term used to indicate the extent to which material is suitable for deep drawing operations.

DRAWING.— Drawing or deep drawing are terms used to describe the formation of sheet metal shapes by the combined actions of a punch, a die, and a blankholder. For the operation to be considered a "drawing" the metal must flow under the blankholder and follow the punch into the die. If the metal is completely locked by the blankholder and no flow occurs, the article is said to be "stretch formed." When the shape is produced by a punch or die without the use of a blankholder, the operation is generally termed "stamping" or "pressing," although no strict definition of these terms exists.

FINISH.— Finish is a term used to define the standard of appearance of a product.

FLATNESS.— Flatness may best be defined when referring to sheet metal as the absence of any wave or buckle. The "out-of-flatness" is referred to as the measured height of buckles when the sheet is laid on a flat surface.

HEAT TREATMENT.— Heat treatment refers to any combination of heating and cooling operations which are applied to a metal with the objective of obtaining altered, and usually enhanced, physical properties.

NORMALISING.— In a normalising operation, steel is heated to a temperature slightly above its upper critical temperature, held for a sufficient length of time to soak thoroughly, and then allowed to cool freely in still air. This treatment is recommended in those cases where further cold-forming operations must be carried out on highly work-hardened sheets.

PICKLE FINISH.—Pickle finish describes the finish remaining on hot rolled sheets after removal of scale layers by pickling in acid.

PRE-STRESSING EQUIPMENT.—Pre-stressing equipment, as referred to in the "Trade Customs," covers any form of rolling or flexing machine which imparts a small amount of cold work to the sheet prior to deep drawing.

RESQUARED.—Describes a sheet which has been guillotined on all four sides to accurate limits as the last stage of production of the sheet.

STRETCH FORMING. — Stretch forming is a process of forming panels and shapes of large curvature by stretching the sheet over a punch which is of the desired shape. The best-known type of stretch-forming machine is the "d'Artz Press."

STRETCHER LEVELLED.—Stretcher levelled, as applied to sheets, indicates a standard of flatness. The term originated from the initial method used to obtain this standard of flatness, that is, the gripping of the ends of a sheet and stretching the sheet to remove surface waves.

TEMPER ROLLING. — Temper rolling, sometimes known as "skin passing," is a relatively light rolling pass given to sheets to overcome the tendency to stretcher-strain, or impart a desired amount of stiffness.

TENSILE STRENGTH OR ULTIMATE TENSILE STRENGTH.— If a prepared sample of steel is strained in a tensile testing machine until it breaks, then the ultimate tensile strength of the material is given by dividing the maximum observed load by the cross-sectional area of the sample.

WELDING.—Welding is a process used to join metals by the application of heat. Fusion welding requires that the parent metals be melted. In pressure welding, joining is accomplished by the use of heat and pressure without melting.

WORKABILITY.—Workability is the characteristic or group of characteristics that determine the ease of forming a metal into desired shapes.

TRADE CUSTOMS — COATED AND UNCOATED SHEETS CUT LENGTHS AND COILS

GENERAL.—While there have been many trade practices developed by the mutual consent of the purchaser and manufacturer, there are possible opportunities for misunderstanding unless trade customs are thoroughly understood.

Special arrangements, not covered in these notes, apply to Electrical Steels.

In the following pages the word manufacturer refers to the manufacturer of the sheets. The word customer means the merchant, distributor, or ultimate user of the sheets.

1. ORDERING OF SHEETS.—Sheets are supplied in a wide range of standard qualities and finishes, and the Company is always prepared to advise customers on a suitable quality for a particular purpose. Where customers select a quality without consulting the Company, the responsibility is his, provided the sheets are up to standard for the grade ordered. Wherever possible, it is to the advantage of the manufacturer and customer to specify the purpose as well as the quality on all orders.

2. SHEETS ORDERED TO SPECIFICATION. — When a customer desires a definite fabricated result, there should be the least possible stipulation on the manufacturer as to how the material must be made.

When it is necessary to supply material to chemical specifications, then the manufacturer cannot in addition assume the responsibility of meeting physical tests and workability results. Similarly, when physical specifications have to be met, there should not be imposed upon the manufacturer the additional necessity of meeting chemical analysis and workability results.

When a customer specifies a definite treatment, then the responsibility for the characteristics of the sheet rests with the customer.

Sheets ordered to a specified chemical analysis can be accepted on the basis of heat analysis only.

- 3. THICKNESS.**—Wherever possible the customer should confine his requirements to those thicknesses which correspond with the even Birmingham Gauge numbers.

When ordering coated sheets, it should be borne in mind that the nominal gauge is the thickness of the sheet prior to coating, and that the applied coating constitutes an additional thickness.

- 4. SURFACE INSPECTION.**—Each cut length will have one side which meets the surface requirements of the grade. Coils may contain imperfections beyond the grade standard, because the producer does not have the same opportunity to reject portions containing such imperfections as in the case of cut lengths.

- 5. SURFACE INSPECTION TOLERANCE.**—A surface inspection tolerance applies to all primes shipped. This tolerance varies with the type of product, and is covered in the relevant grade specifications.

- 6. OFF-GAUGE MATERIAL.**—Since it is impracticable for the manufacturer to gauge every cut length comprehensively, such thickness inspection becomes the responsibility of the user whenever it is considered a necessity.

It is standard practice in many plants to perform this gauge inspection on uncoated cut lengths, and any pieces which the customer finds outside the thickness tolerances are subject to rejection. Such material must be referred to the manufacturer.

If a customer decides not to perform a thickness inspection on every piece, and if, as a result, some over-gauge sheet should cause damage to his equipment, the responsibility for such damage rests on the customer.

The basis of all sheet gauging is weight per unit area and, in the case of coated and some uncoated sheets, this is the only practical and acceptable criterion of gauge.

In the case of coil, the manufacturer has not the same opportunity for rejecting portions as for cut lengths and, therefore, the foregoing does not necessarily apply to coil.

It is the responsibility of the customer to establish gauge conformity prior to cutting up and fabrication.

7. AGEING AND STRETCHER STRAINING.—Material in the dead-soft or annealed condition is particularly suited for a variety of purposes, but is subject to stretcher straining and fluting which is not the responsibility of the manufacturer. A certain amount of pre-stressing will prevent this tendency, but only temporarily, due to the ageing phenomenon, which is accompanied by a loss of ductility and increase in hardness, etc. For this reason, material should be fabricated as promptly as possible. It is, in addition, customary to carry out a pre-stressing operation with approved equipment immediately prior to fabrication. Since this process is considered the responsibility of the customer, any costs or charges for this operation are his.

The above requirements apply in all except those cases where stabilized materials are available and specified.

8. HEAT TREATMENT BY CUSTOMER.—The manufacturer cannot assume responsibility for the behaviour of material after any heat treatment which he has not approved. When heat treatment is required for property development purposes, the manufacturer will guarantee the response of the material to his approved conditions.

9. BREAKAGE TOLERANCE—FABRICATION:

(a) **General Comment.**—Until the operations of any individual fabrication have been properly developed to produce suitable components for production runs, full absorption of breakage loss must be assumed by the customer.

(b) **Normal Breakage.**—It has long been the general practice for the customer to absorb breakage up to and including 3% of the sheets run, that is, the customer will absorb that percentage on established fabricating operations.

(c) **Special Breakage Tolerance.**—There are many applications where it is necessary for the manufacturer to be allowed more than 3% for breakage. After the blank size has been properly developed and the dies are approved for production and the processes are standardized, a special breakage tolerance shall be established on a minimum run of 500 units.

(d) **Basis for Computing Claims.**—Whenever breakage exceeds the normal breakage tolerance on any part, the manufacturer should be notified immediately and the run discontinued, or the responsibility shall rest with the customer. After inspection of the broken parts and the dies, the manufacturer shall decide whether the run is to continue or whether the material is to be withdrawn.

Percentage breakage is to be calculated on quantity production of a continuous run, which may cover a weekly or monthly period or be based on a minimum quantity of two tons or the whole order, whichever is the less.

The same tolerances which apply to breakage apply also to parts rejected as unusable for any other cause, with the exception that the manufacturer accepts all responsibility for laminated sheets.

10. SUB-STANDARD MATERIAL. — The manufacturer will replace any unfabricated sheets which fail to meet the grade standards. Rejections for such causes should be kept separate for inspection, and the rejection or salvage of such material shall be subject to negotiation.

11. LIMITATION OF LIABILITY.—Should it be determined that material which has been fabricated is defective, it is not the responsibility of the manufacturer to assume any labour costs involved in the fabrication or handling of the defective sheets, or any other consequential damage.

The customer should not proceed with the drawing, fabricating or pressing of the material if it is proving unsuitable and, in this event, the manufacturer should be notified immediately. After the latter has made an investigation and the material is found to be defective, it then becomes a matter of negotiation between the customer and the manufacturer as to what disposition is to be made of the material which has not yet been used, and also to determine whether the material which has been used can be salvaged in the interests of both parties.

LYSAGHT EXPANDED METAL

Expanded Metal is used in almost every branch of engineering and building. It is made from sheet metal which, by slitting and expanding, without any waste of material, is converted into a network of diamond-shaped openings.

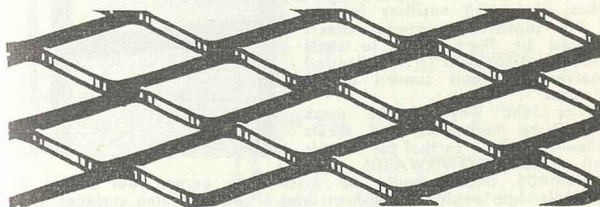
Unlike netting, Expanded Metal is not an interlacing of loose or separate pieces. The strands are all part of the parent metal, rigidly unified at their junctions.

Lysaght Expanded Metal is produced in three types:—

- (a) Metalath—for plastering work in the building trade.
- (b) Ornamesh—for industrial, decorative and general use where a high degree of accuracy and finish is required.
- (c) Gridmesh—produced from heavy steel plate for use on cat-walks, stair treads, etc.

Many ductile materials can be expanded, such as steel, aluminium, copper, brass and other alloys, but the chief material for Expanded Metal is Lysaght high-grade low carbon steel sheet.

Lysaght Metalath



LYSAGHT METALATH

Catalogue No.	Sheet sizes Width Length		No. Sheets per Bundle	Weight per Bundle
PL25, FL25 — For general plastering and wall tiling (2.5 lbs./sq. yd.) ..	27"	8'	10 (20 sq. yds.)	50 lbs.
	27"	9'	10 (22½ sq. yds.)	56½ lbs.
PL34, FL34 — For light-weight fireproof construction (3.4 lbs./sq. yd.)	27"	8'	5 (10 sq. yds.)	34 lbs.
	27"	9'	5 (11¼ sq. yds.)	38½ lbs.

MATERIAL.— Steel coated with a rust inhibitor, or galvanized if specified. PL34 and FL34 have a painted yellow edge.

Lysaght Metalath is most extensively used as a plaster lathing. Plaster should be applied in situ, without joints to mar the surface, on a background of Metalath. The most important requirement of the background is that it should provide an adequate key for the plaster.

In each square foot of Lysaght Metalath there are approximately 900 meshes, each forming a perfect "key" for the support and reinforcement of the rendering. The excellent "keying" property of Metalath is graphically portrayed in the accompanying illustration. Note how the rendering fills the openings and locks tightly around the tough steel strands, offering maximum resistance to shocks and stresses.

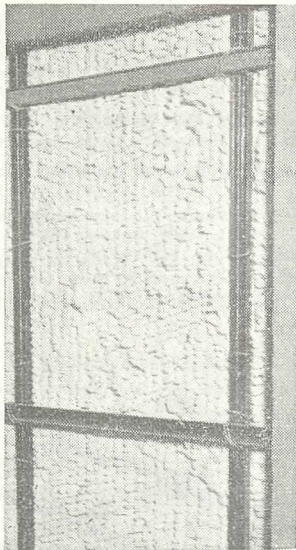
Two types of "Metalath" are available, "PL" and "FL." With the former type, auxiliary furring is necessary.

The "FL" type, however, has staggered perforations $\frac{3}{8}$ " deep which hold the body of the Metalath away from the studs, thus eliminating auxiliary furring.

For plastering purposes sheets should be fixed firmly to studs and noggings with $1\frac{1}{2}$ " flat-headed galvanized clouts spaced at 6" centres.

The long way of the mesh MUST be horizontal, and sheets should be fixed so that the strands all slope DOWNWARDS and

INWARDS. Sheets should not finish in a corner, but should be bent at right angles to finish at least 6" on adjoining surfaces. Laps should be not less than 1" on ends and $\frac{1}{2}$ " in sides, and all laps should be tied with 18G soft galvanized wire at 6" centres.



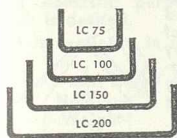
TIMBER-FRAMED CONSTRUCTION.—Metalath is used extensively as a background and reinforcement for wall tiles and for exterior stucco work.

Unless "FL" type Metalath is used in this type of construction, auxiliary furring is required. This generally consists of 8-gauge wire stapled to the faces of all studs and noggings. Alternatively, bottle tops may be used. These are nailed into position as the sheets of Metalath are being fitted.

PLASTER ENCASEMENT OF STEEL WORK.—Lysaght Metalath is used extensively for fire-proofing, both with concrete and lightweight plasters. Suspension channels, corner beads and other accessories are made for this type of construction, and also for lightweight solid and hollow acoustic partitions. Metalath is easily bent to suit ornamental plaster work.

Lysaght Metalath Accessories

LYSAGHT COLD ROLLED CHANNEL



An accurately formed channel of uniform straightness and weight. May be used for a variety of purposes, including framing for Metalath and plaster application.

MATERIAL.— 16G mild steel coated with rust inhibitor.

LENGTHS.— 16' and 20'.

SIZES AND WEIGHTS (per 1,000 lin. ft.).—

LC 75— $\frac{3}{4}$ " x $\frac{1}{2}$ "—320 lb.
LC 100—1" x $\frac{1}{2}$ "—375 lb.
LC 150—1 $\frac{1}{2}$ " x $\frac{5}{8}$ "—530 lb.
LC 200—2" x $\frac{5}{8}$ "—640 lb.

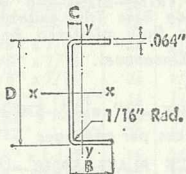
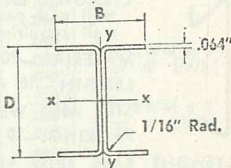
PACKING.—

Minimum Weight of Bundle

Lengths of Bundle	LC75 20 lengths/bundle	LC100 20 lengths/bundle	LC150 10 lengths/bundle	LC200 10 lengths/bundle
16'	102 lb.	120 lb.	84 lb.	102 lb.
20'	128 lb.	150 lb.	106 lb.	128 lb.

STRUCTURAL PROPERTIES

Section



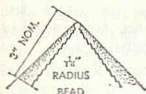
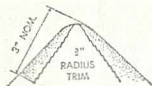
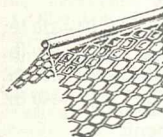
Catalogue Ref. No. ...	LC75	LC100	LC150	LC200	2/LC75	2/LC100	2/LC150	2/LC200
Size, ins.	$\frac{3}{4}$ x $\frac{1}{2}$	1 x $\frac{1}{2}$	1 $\frac{1}{2}$ x $\frac{5}{8}$	2 x $\frac{5}{8}$	$\frac{3}{4}$ x 1	1 x 1	1 $\frac{1}{2}$ x 1 $\frac{1}{4}$	2 x 1 $\frac{1}{4}$
Sectional Area, ins. ²	.096	.112	.160	.192	.192	.224	.320	.384
Weight, lbs./ft.	.320	.375	.530	.640	.640	.750	1.060	1.280
Centre of Gravity C, ins.	.175	.155	.171	.147	—	—	—	—
Moment of Inertia:								
About XX, in. ⁴	.0078	.0157	.0507	.1023	.0155	.0313	.1014	.0245
About YY, in. ⁴	.0020	.0022	.0049	.0054	.0098	.0099	.0191	.0192
Modulus of Section:								
About XX, in. ³	.0207	.0313	.0676	.1023	.0414	.0626	.1352	.2046
About YY, in. ³	.0061	.0066	.0109	.0115	.0199	.0200	.0309	.0310
Radius of Gyration:								
About XX, in.	.284	.374	.563	.730	.284	.374	.563	.730
About YY, in.	.143	.141	.175	.168	.226	.210	.244	.223

NOTE.— Channels are not supplied attached to each other in any way. Section Properties for two sections combined "web to web" are listed for design purposes only.

LYSAGHT CORNER BEAD

SMALL NOSE—SB30

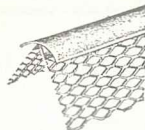
A die-straight bead with expanded wings 3" wide. Used in reinforcing the corners of columns, beams and masonry work. The expanded wings provide an excellent plaster key right up to the nose of the bead.



SB 30

BULL NOSE—BB303

A broad nose trim spot welded to expanded wings 3" wide. Used to reinforce exterior corners where rounded edges are desired. Generally used in buildings, hospitals, etc., where sharp corners are subject to damage by floor trolleys, wheel chairs, etc.



BB 303

SB 30—26G galvanized, 8', 9', 10' and 12'. 170 lb./1,000 l. ft.

BB303 { 20G Zincanneal Trim, 7', 8', 9', 10' and 12'. 350 lb./1,000 l. ft.
 { 26G Wing (galvanized).

LYSAGHT BASE TRIM—BT250.—An accurately formed wall and partition Base Trim suitable for any type of wall requiring a flush plastered finish.

MATERIAL.—20G Zincanneal.

LENGTH.—10' only.

SIZE AND WEIGHT.—2½" x 5/8"—570 lb. per 1,000 l./ft.

PACKING.—10 pieces per package.

LYSAGHT BASE TRIM SPLICE PLATE—SP250.—Used to butt join Base Trims to provide an unbroken line.

LYSAGHT BASE TRIM CLIP—BC200.—A special galvanized wire clip for holding the Base Trim to the ¾" channel studs.

LYSAGHT FLOOR RUNNER—FR100.—A steel channel suitable for 2" solid partitions with metal base trims.

LYSAGHT CASING BEAD—SC4, SC6, SC7.—A short-wing Casing Bead used as a plaster stop and trim around doors, windows and other openings.

LYSAGHT CEILING RUNNER—CR500, CR510, CR516.—A specially designed steel section for fastening to the ceiling in order to provide positive anchorage and alignment for ¾" and 1½" channels.

LYSAGHT BEAM RUNNER—BR75, BR150.—A steel section similar in application to the Ceiling Runner. Attached to a beam, it holds the ¾" and 1½" channels in alignment.

Lysaght Ornamesh

Lysaght Ornamesh is extensively used for industrial decorative and domestic purposes where a high degree of accuracy and finish is desired.

It is available in mesh and sheet sizes shown in the tables below.

LOW CARBON STEEL ORNAMESH

Catalogue No.	Nominal Weight in lbs. per sq. ft.	Nominal Size of Mesh		Gge.	Strand Width		Standard Sheet size
		SWM	LWM		Nom.	Actual	
Low Carbon Steel							
H2601	0.44	1/16" x 1/8"		26	1/64"	.020"	} 4' SWM x 1' LWM
P2602	0.51	1/8" x 15/64"		26	1/32"	.040"	
P2601	0.26	1/8" x 15/64"		26	1/64"	.020"	} 4' SWM x 2' LWM
Q2602	0.34	3/16" x 13/32"		26	1/32"	.040"	
Q2604	0.45	3/16" x 13/32"		26	1/16"	.060"	
R2305	0.64	19/64" x 17/32"		23	5/64"	.080"	
R2602	0.25	19/64" x 17/32"		26	1/32"	.040"	
S2302	0.36	15/64" x 5/8"		23	1/32"	.040"	
S2604	0.40	15/64" x 5/8"		26	1/16"	.060"	
T2302	0.25	3/8" x 53/64"		23	1/32"	.040"	
T2604	0.25	3/8" x 53/64"		26	1/16"	.060"	} 4' SWM x 3' or 4' LWM
A2203	0.78	1/8" x 7/16"		22	3/64"	.050"	
A2403	0.66	1/8" x 7/16"		24	3/64"	.050"	
A2602	0.43	1/8" x 7/16"		26	1/32"	.040"	
C1604	0.88	11/32" x 1-1/8"		16	1/16"	.060"	} 7' SWM x 3' or 4' LWM
C2004	0.56	11/32" x 1-1/8"		20	1/16"	.060"	
C2204	0.43	11/32" x 1-1/8"		22	1/16"	.060"	
D1606	0.66	5/8" x 1-1/2"		16	3/32"	.080"	} 9' 6" SWM x 3' or 4' LWM
D2006	0.40	5/8" x 1-1/2"		20	3/32"	.080"	
D2206	0.32	5/8" x 1-1/2"		22	3/32"	.080"	
F1408	0.81	7/8" x 2-1/4"		14	1/8"	.110"	
F1608	0.65	7/8" x 2-1/4"		16	1/8"	.110"	
G1012	1.32	1-25/64" x 3"		10	3/16"	.180"	
G1408	0.56	1-25/64" x 3"		14	1/8"	.120"	
G1606	0.33	1-25/64" x 3"		16	3/32"	.090"	
H1016	1.36	1-7/8" x 4-1/2"		10	1/4"	.250"	
H1410	0.51	1-7/8" x 4-1/2"		14	5/32"	.150"	
H1608	0.34	1-7/8" x 4-1/2"		16	1/8"	.120"	

SHEET TOLERANCES

Width: Plus $\frac{3}{4}$ ", minus 0".

Length: F, G, H, meshes plus 2", minus 0". All other meshes plus 1", minus 0".

TYPICAL USES.— Baskets, grilles, shelving, ornamental trim, screens, ventilators.

FINISHES.— Oiled or coated with a rust inhibitor.

Flattened Ornameash

Lysaght Flattened Ornameash proves extremely satisfactory where a smooth, flat surface is required. After the steel sheet is expanded it is passed through pressure rolls which flatten the strands and bonds into the same plane. The gauge or thickness is slightly reduced without appreciably affecting the strength.

Catalogue No.	Nominal Weight in lbs. per sq. ft.	Nominal Size of Mesh SWM LWM	Gge.	Strand Width		Standard Sheet size
				Nom.	Actual	
Flattened Steel						
P2602	0.45	9/64" x 15/64"	26	1/32"	.044"	4' SWM x 2' LWM
P2601	0.23	9/64" x 15/64"	26	1/64"	.022"	
Q2602	0.30	13/64" x 13/32"	26	1/32"	.044"	
Q2604	0.40	13/64" x 13/32"	26	1/16"	.066"	
R2305	0.58	21/64" x 17/32"	23	5/64"	.088"	
R2602	0.22	21/64" x 17/32"	26	1/32"	.044"	
S2302	0.32	17/64" x 5/8"	23	1/32"	.044"	
S2604	0.36	17/64" x 5/8"	26	1/16"	.066"	
T2302	0.22	13/32" x 53/64"	23	1/32"	.044"	4' SWM x 3' or 4' LWM
A2203	0.70	9/64" x 7/16"	22	3/64"	.055"	
A2403	0.60	9/64" x 7/16"	24	3/64"	.055"	
A2602	0.39	9/64" x 7/16"	26	1/32"	.044"	7' 6" SWM x 3' or 4' LWM
C1604	0.80	3/8" x 1-1/8"	16	1/16"	.066"	
C2004	0.50	3/8" x 1-1/8"	20	1/16"	.066"	
C2204	0.39	3/8" x 1-1/8"	22	1/16"	.066"	10' SWM x 3' or 4' LWM
D1606	0.60	11/16" x 1-1/2"	16	3/32"	.099"	
D2006	0.36	11/16" x 1-1/2"	20	3/32"	.099"	
D2206	0.29	11/16" x 1-1/2"	22	3/32"	.099"	
F1408	0.73	1" x 2-1/4"	14	1/8"	.132"	10' SWM x 3' or 4' LWM
F1608	0.59	1" x 2-1/4"	16	1/8"	.132"	
G1408	0.50	1-17/32" x 3"	14	1/8"	.132"	
G1606	0.30	1-17/32" x 3"	16	3/32"	.099"	
H1410	0.46	2-1/16" x 4-1/2"	14	5/32"	.165"	10' SWM x 3' or 4' LWM
H1608	0.31	2-1/16" x 4-1/2"	16	1/8"	.132"	

SHEET TOLERANCES

Width: Plus $\frac{3}{4}$ ", minus 0".

Length: Some variation in sheet length may occur as a result of the flattening process. However, the standard lengths shown above will be the minimum length supplied.

TYPICAL APPLICATIONS.—Machinery guards, ironing boards, functional furniture, storage bins.

FINISHES.—Oiled, coated with a rust inhibitor, or galvanized (D, F, G, and H meshes only).

Aluminium Ornamesh

Catalogue No.	Nominal Weight in lbs. per sq. ft.	Nominal Size of Mesh SWM LWM	Ggs.	Strand Width Nom.	Actual	Standard Sheet size
Aluminium						
MA2601	0.14	1/16" x 1/8"	26	1/64"	.010"	} 4' SWM x 1' LWM
PA2601	0.08	1/8" x 15/64"	26	1/64"	.020"	
PA2602	0.16	1/8" x 15/64"	26	1/32"	.040"	} 4' SWM x 2' LWM
QA2602	0.11	3/16" x 13/32"	26	1/32"	.040"	
QA2604	0.16	3/16" x 13/32"	26	1/16"	.060"	
RA2205	0.21	19/64" x 17/32"	22	5/64"	.080"	
RA2602	0.68	19/64" x 17/32"	26	1/32"	.040"	
SA2202	0.13	15/64" x 5/8"	22	1/32"	.040"	
SA2604	0.13	15/64" x 5/8"	26	1/16"	.060"	} 4' SWM x 3' or 4' LWM
TA2202	0.08	3/8" x 53/64"	22	1/32"	.040"	
TA2604	0.08	3/8" x 53/64"	26	1/16"	.060"	
AA2203	0.25	1/8" x 7/16"	22	3/64"	.050"	
AA2402	0.17	1/8" x 7/16"	24	1/32"	.040"	} 7' SWM x 3' or 4' LWM
CA1604	0.29	11/32" x 1-1/8"	16	1/16"	.060"	
CA2004	0.18	11/32" x 1-1/8"	20	1/16"	.060"	
CA2204	0.14	11/32" x 1-1/8"	22	1/16"	.060"	
DA1606	0.21	5/8" x 1-1/2"	16	3/32"	.080"	} 9' 6" SWM x 3' or 4' LWM
DA2006	0.13	5/8" x 1-1/2"	20	3/32"	.080"	
DA2206	0.10	5/8" x 1-1/2"	22	3/32"	.080"	
FA1608	0.21	7/8" x 2-1/4"	16	1/8"	.110"	
GA1012	0.43	1-25/64" x 3"	10	3/16"	.180"	
GA1606	0.10	1-25/64" x 3"	16	3/32"	.090"	
HA1016	0.44	1-7/8" x 4-1/2"	10	1/4"	.250"	
HA1608	0.11	1-7/8" x 4-1/2"	16	1/8"	.120"	

SHEET TOLERANCESWidth: Plus $\frac{3}{4}$ ", minus 0".

Length: F, G, H, meshes plus 2", minus 0". All other meshes plus 1", minus 0".

TYPICAL USES.—Electrical screening, radio and T.V. grilles, display stands, shop window displays, lampshades, room dividers.**NOTE.**—Lysaght Ornamesh can be provided also in copper, brass and stainless steel. Full details on application.

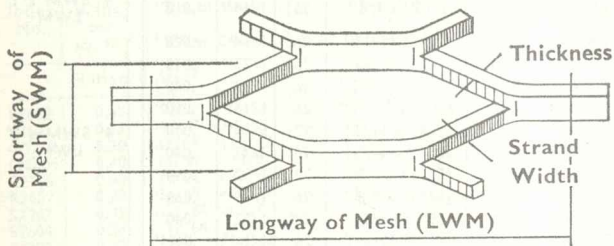
LYSAGHT GRIDMESH

Lysaght Gridmesh is a heavy duty type Expanded Metal made from steel plate.

Designed especially for use as a lightweight open steel flooring, it is lighter than solid sheet of equal load-bearing capacity.

The angular ridged surface formed by the multiple junctions of the strands provides excellent non-slip qualities.

MESH DETAIL



SPECIFICATIONS

Catalogue No.	Weight (lbs./sq. ft.)	Nom. size of Mesh SWM x LWM	Material Thickness	Strand Width	Standard Sheet Sizes
GR300	3	1-5/8" x 5-1/3"	3/16"	5/16"	10' 0" x 24", 30", 36" or 48"
GR400	4	1-3/4" x 5-1/3"	3/16"	7/16"	7' 6" x 24", 30", 36" or 48"

SHEET TOLERANCES.— Width: plus $\frac{3}{4}$ ", minus 0".
Length: plus 2", minus 0".

SELECTION TABLE

Load	Span of Supports		
	24"	30"	36"
50 lb./sq. ft. (Distributed)	GR300	GR300	GR400
100 lb./sq. ft. "	GR300	GR400	—
250 lb. @ 4' centres (conc.)	GR300	GR300	GR400

FINISHES.— Galvanized and Black.

PACKING.— Bundles to suit individual orders.

A range of "Gridmesh" Stair and Ladder Treads is also available.

STEEL DECKING

Lightweight fireproof building construction is rapidly becoming an integral part of modern building methods.

Steel Decking is used extensively in this type of construction.

John Lysaght (Australia) Limited, who manufacture a wide range of decks for roofing, flooring and wall cladding (at their Newcastle Works) would be pleased to advise on matters relating to the use of Steel Decking in lightweight building construction.

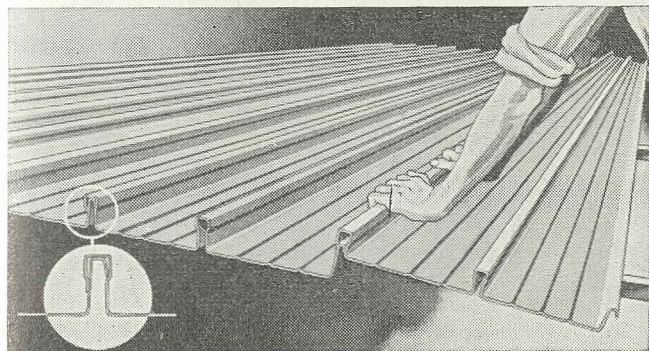
KLIP-LOK STEEL DECK

Australian Patent (222,046)

Klip-Lok, which is used mainly for roofing and wall cladding, is a roll-formed high-strength galvanized steel deck 12" wide with $1\frac{1}{2}$ " x $\frac{5}{8}$ " ribs at 6" centres, and with continuous shouldered edges to interlock over the sides of adjacent decks.

This positive locking action, which requires no additional side fixing, ensures a completely waterproof and dustproof joint. It also provides a very rigid roof or wall sheeting, and has the added advantage that any concentrated load applied to one deck is spread amongst adjacent decks which assist in supporting this load.

Being light in weight, Klip-Lok requires less structural framing, and the unique rib design provides great strength and rigidity over long spans.



MATERIAL.—Klip-Lok is produced in 22G and 26G high-grade galvanized steel sheet. It is also available in aluminium, copper, zinc and translucent fibreglass.

APPLICATIONS.—Klip-Lok is used for all types of buildings, and is especially suitable for flat or near-flat roofs. Long lengths enable many structures to be covered with single lengths of deck, thereby eliminating end laps.

INSTALLATION.— Klip-Lok is used for roofing in two ways, generally fixed "ribs-up" as a normal non-insulated roof, and requires no further covering. Also used "ribs-down" as the deck for a conventional built-up roof.

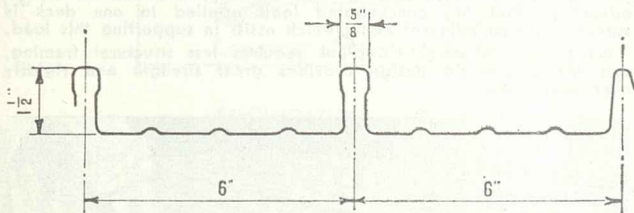
As a wall cladding it is normally fixed "ribs-out" in conjunction with the specially developed secret Fixing Strap.

KLIP-LOK FIXING STRAP.— A galvanized steel Fixing Strap is available for fixing Klip-Lok to steel or timber without piercing the deck surface. Being hidden from view, the Fixing Strap is a positive method of holding roofing and wall cladding to supports without marring the pleasing ribbed appearance. Alternatively, Klip-Lok may be welded or bolted to steel, or screwed or bolted to timber structures.

MAXIMUM LENGTHS.— 22G—50' (galvanized steel only).

26G—36'.

KLIP-LOK PROFILE



ENGINEERING DATA.—

26G:

Weight per square foot: 1.22 lb.

Roofs—Maximum purlin spacing: 4' centres.

Walls—Maximum girt spacing: 6' centres.

22BG:

Weight per square foot: 2.17 lb.

Roofs—Purlin spacings: Generally a span of 7' to 8' will suit most applications.

Walls—Girt spacings up to 10' will generally be satisfactory.

GENERAL DETAILS.— Deck tolerances: Length $+\frac{1}{4}$ ", $-\frac{1}{4}$ "; width $+\frac{1}{16}$ ", -0 ".

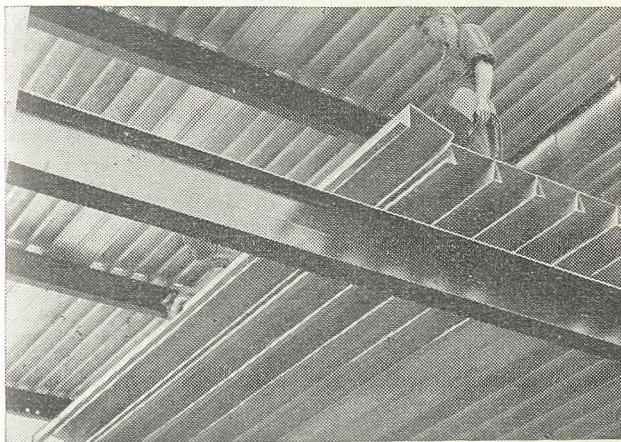
DELIVERY CONDITIONS.— Supplied and delivered to site (city areas all capital cities) cut to lengths ordered up to 36' in 26G and 50' in 22G.

TRI-LOK STEEL DECK

Australian Patent (223,584)

Lysaght Tri-Lok Steel Deck System is a lightweight building construction system, the performance of which can be calculated by means of simple engineering principles. The result is a parallel system of strong structural interlocking members predictable in performance.

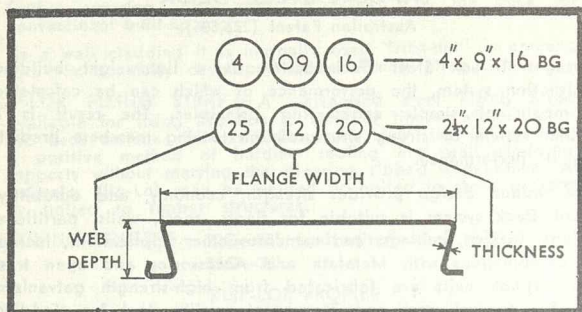
The unique design provides strength, economy, and durability. Tri-Lok Deck system is suitable for floors, roofs, walls, partitions, awnings, facings, ceilings, and numerous other applications, including combinations with Metalath and Accessories and open truss work. Tri-Lok units are fabricated from high-strength galvanized steel for general work and Zinccanneal quality steel for cladding or exposed ceilings.



The illustration above shows Tri-Lok Steel Decks being placed in position.

MAXIMUM LENGTHS.—Galvanized finish, 20'; Zinccanneal finish, 12'.

The following diagram illustrates the system used in cataloguing Tri-Lok Decks.



DECK RANGE.—

Floor Decks: Catalogue Nos. 61216, 51516, 40916, 40918, 30916, 31216, 30918.

Roof Decks: Catalogue Nos. 40920, 31218, 30920, 31220, 251220, 21218, 21220.

Any of the above may be used for wall cladding.

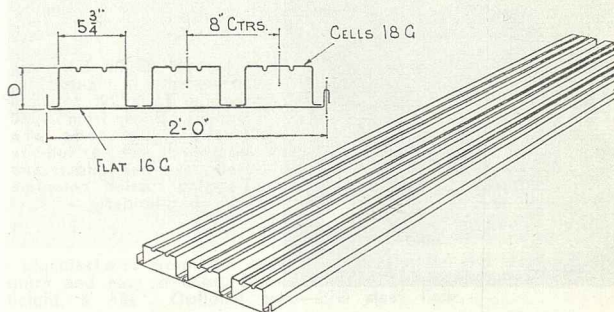
ACCESSORIES.—A range of starter and closer panels is available for use with Tri-Lok Steel Deck. Illustrations of the various types are shown below:—

TABLE OF STARTER AND CLOSER PANELS
TOP FLANGE WIDTHS

Tri-Lok Series	Type "LF"	Type "ML"	Type "SL"	Type "MS"	Type "SF"
612	10½"	9¾" to 12"	20"	21½"	20"
515	13¾"	9" to 15"	21¾"	23"	21½"
409	7½"	7" to 9"	14"	15½"	14"
312	10¾"	6" to 12"	15¾"	17"	15½"
309	7¾"	6" to 9"	12¾"	14"	12½"
2512	11"	6" to 12"	15"	16"	15"
212	11¼"	5" to 12"	14¼"	15¼"	14¾"

CELDEK STEEL DECK

A lightweight high-strength galvanized steel cellular type floor deck which provides complete electrical availability for high and low potential circuits, telephone, intercommunication or signal services throughout the entire floor area. Floor outlet fittings can be installed quickly wherever and whenever they are required.



LENGTHS.—8' to 20' in $\frac{1}{4}$ " increments.

TOLERANCE.—Length, $+0''$, $-\frac{1}{4}''$.

PROPERTIES

ALL PROPERTIES PER 1' WIDTH OF DECK

CATALOGUE NUMBER	Overall Depth D in.	Assembled Weight lb./ft. ²	Coeff. of Strength Cs	Modulus of Section in. ³	Coeff. of Deflection (1/360) Cd.	Moment of Inertia in. ⁴	Max. Shear Load lb.	End Bearing	
								1" Landing lb.	Increment per 1" lb.
3/200-C18/F16	2 $\frac{11}{16}$ "	6.34	12,170	1.014	57,900	1.325	3,470	870	360
3/350-C18/F16	3 $\frac{5}{8}$ "	7.13	24,040	2.003	194,600	4.453	6,150	800	280
3/450-C18/F16	4 $\frac{5}{8}$ "	7.65	32,880	2.740	335,700	7.682	5,230	750	230

For Simple Spans and Distributed Loading the following Formulae apply:

Per 1' width of deck, where Wt. = Total Distributed Load Lb./Ft.²—W (live) = Live Load Lb./Ft.²; L = Span of Deck Ft.;

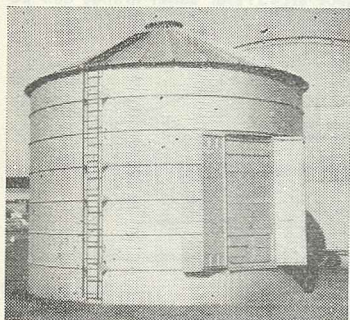
Wt. = Cs $\div$ L²; W (live) (For $\frac{L}{360}$ Deflection) = Cd $\div$ L³.

ADVISORY SERVICE.—Our Engineering Advisory Service is available to architects, engineers and builders for advice on design and specification data.

To speed the handling of enquiries, all correspondence should be directed to the Branch Office of John Lysaght (Australia) Limited in your State.

Lysaght Prefabricated Rural Products

GRAIN SILOS (Patent pending)

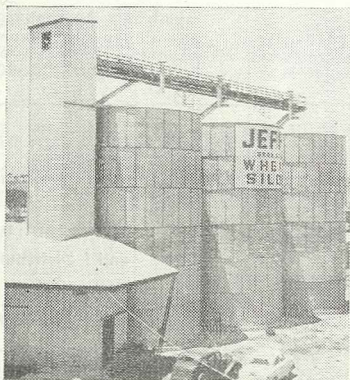


Lysaght Grain Silos are produced in capacities ranging from 200 to 3,700 bushels. Silos from 1,200 bushels upwards are equipped with a full-size door, external ladder, and bagging outlet complete with bag-holder.

FLAT PLATE SILOS (Patent pending)

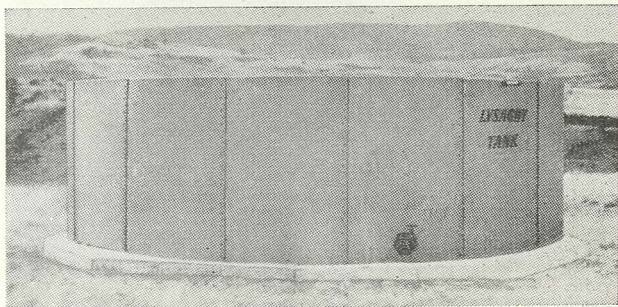
Prefabricated Flat Plate Steel Silos to 60,000 bushels capacity can be manufactured to order.

For further details and agents' names, write to John Lysaght (Australia) Limited — Offices in all Capital Cities and Newcastle Works.



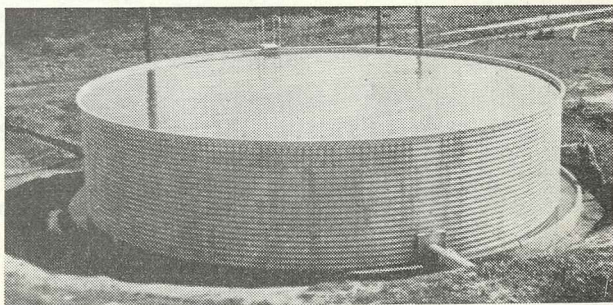
OPTIONAL EXTRAS AVAILABLE.—Steel floor and steel earth ring. A range of Lysaght Vertical Augers (Spiral Conveyors) is available for filling all Lysaght Silos from 1,200 bushels to 3,700 bushels capacity.

LARGE CAPACITY WATER TANK FLAT PLATE



Manufactured from 16G galvanized steel plate and designed for quick and easy erection. Capacity 10,000 gallons. Diameter, 19' 6"; height, 5' 10 $\frac{1}{4}$ ". Optional extra—22G steel floor.

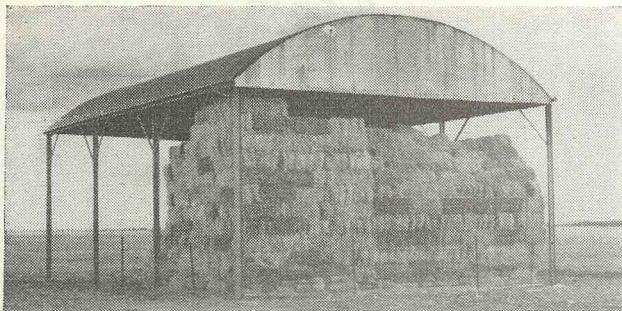
LARGE CAPACITY WATER TANKS CORRUGATED



Large-capacity Water Tanks of heavy gauge galvanized curved sheets are manufactured in four standard sizes:—25,000, 50,000, 75,000 and 100,000 gallons.

For further details and agents' names write to John Lysaght (Australia) Limited—Offices in all Capital Cities and Newcastle Works.

LYSAGHT HAY SHED

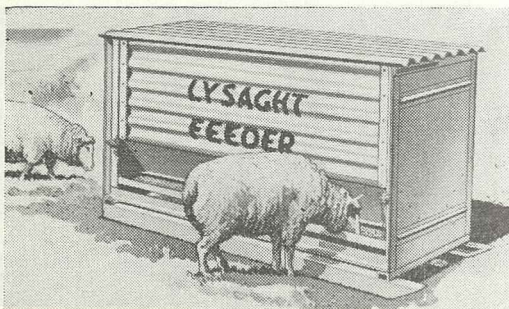


Width		30 feet	Overall height		22 feet
Length		45 feet	Capacity		4,680 bales
Height to eaves	..	16 feet			

Structural steel frame fully braced. Supplied complete with pre-curved galvanized steel roof, end gable sheeting, and all fixing accessories.

Optional extras available:—Guttering and downpiping.

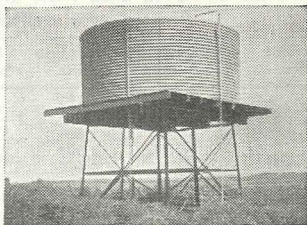
LYSAGHT SHEEP SELF FEEDER



50-bushels capacity. Total trough length 16'—8' each side. Full opening hinged lid. Adjustable swinging troughs. Sturdy skid base for towing.

For further details and agents' names write to John Lysaght (Australia) Limited—Offices in all Capital Cities and Newcastle Works.

LYSAGHT ORB CORRUGATED STEEL SHEETS FOR TANK-MAKING



In Australia to-day many millions of gallons of water are safely stored in tanks made from Lysaght Blue Orb Corrugated Galvanized Steel Sheet. Ranging in size from the familiar 500-gallon householder tank to giants capable of holding 100,000 gallons, they have proved themselves the most economical and efficient means of storing water available to the country dweller.

In industry, where supplies of "soft" rain water are a necessary part of the manufacturing process, Lysaght Blue Orb Galvanized Steel Sheet provides adequate storage facilities at low cost extended over many years.

CAPACITY OF TANKS — CALCULATIONS

SQUARE OR RECTANGULAR SECTION.—All dimensions in feet:—

length x breadth x depth x $6\frac{1}{4}$ = capacity in gallons.

CIRCULAR.—Capacity in gallons given by either of the following rules:—

A. $\frac{11}{4} \times (\text{diameter})^2 \times \text{height} \times 6\frac{1}{4}$.

B. Multiply circumference by itself and by half the height — $C^2 \times h/2$.

C. Multiply diameter by itself and by five times the height — $D^2 \times 5h$.

Example.—Diameter 6ft., height 6ft.

$$6 \times 6 \times 30\text{ft.} = 1,080 \text{ gals. approximately.}$$

Capacity of Corrugated Galvanized Sheet Tanks

WALL SHEETS ALL OF ONE SIZE FOR EACH TANK

Height of Tank	No. of Sheets to the Tank Perimeter	Capacity in Gallons				
		8ft. Sheets	9ft. Sheets	10ft. Sheets	11ft. Sheets	12ft. Sheets
4' or Two Rings	1	—	—	180	220	270
	2	470	600	740	910	1,080
	3	1,060	1,350	1,680	2,050	3,450
	4	1,900	2,400	3,000	3,600	4,300
	5	3,000	3,700	4,600	5,500	6,600
	6	4,200	5,200	6,500	7,900	9,500
	7	5,500	7,000	10,900	10,300	12,400
	8	7,200	9,200	12,400	13,400	16,200
6' or Three Rings	4	2,800	3,600	4,500	5,300	6,300
	5	4,400	5,400	6,700	8,200	9,900
	6	6,100	7,800	9,700	11,300	13,600
	7	8,200	10,000	12,500	15,400	18,600
	8	10,000	13,000	16,400	20,100	24,300
	9	12,700	16,500	20,800	25,500	30,700
	10	15,700	20,400	25,600	31,500	37,900
	11	19,100	24,700	31,000	38,100	45,900
8' or Four Rings	12	22,700	29,400	36,900	45,400	54,600
	4	—	—	5,700	7,000	8,400
	5	5,600	7,200	9,000	10,500	12,600
	6	8,100	9,800	12,300	15,100	18,200
	7	10,300	13,300	16,700	20,600	24,800
	8	13,400	17,400	21,900	26,900	32,400
	9	18,200	22,000	27,700	34,000	41,000
	10	21,000	27,200	34,200	42,000	50,600
	11	25,400	32,900	41,400	50,800	61,200
	12	30,200	39,200	49,300	60,500	72,900

The above allows sheet end lap of—

4" for tanks up to 5,000 gallons.

6" for tanks from 5,000 gallons to 10,000 gallons.

9" for tanks over 10,000 gallons.

GAUGE OF WALL SHEETS

Maximum diameters allowable

Height of Tank in ft.	Gauge					
	24	22	20	18	16	14
	ft.	ft.	ft.	ft.	ft.	ft.
4	30	38	48	60	75	90
6	20	25	32	40	50	60
8	15	18	24	30	36	42

CORRUGATED GALVANIZED STEEL TANKS

RECOMMENDATIONS

1. Use only Lysaght Blue Orb Galvanized Sheet.
2. Curve sheets gently and gradually. Severe changes in curvature on each pass and rapid speeds tend to force the zinc coating off the sheets. Curving rolls should be smoothly dressed, aligned, etc.
3. Tanks intended for use as rainwater tanks should be treated with TECT-A-TANK before filling. Tanks intended for the storage of underground or river waters should be painted inside with zinc dust/zinc oxide paint containing 12lb. of zinc dust per gallon, or a paint made of
 - 2½ lb. of cement,
 - 1 pint of boiled linseed oil,
 - 1 oz. of gold size or ¼ pint of terebine.The mixture should be well stirred during use.
4. All tanks should be fed individually from the supply, and not by connecting one tank to another. If tanks are connected to a common main, then cocks must be provided between each tank and the main to prevent inter-tank flow of water.
5. Provide strainers to prevent contamination by leaves, etc.
6. Provide ample ventilation in the case of covered tops.
7. Where practicable, install in shade.
8. In case of early failure of tank, advise the nearest office of John Lysaght (Australia) Limited, because renewal in the same form may give a repetition of the first experience. In very few cases has early failure been entirely due to any fault in the galvanized sheet.
9. If it is suspected that the water to be stored is corrosive to galvanized steel sheet, send a sample of about two pints to the nearest office of John Lysaght (Australia) Limited, together with all relevant information. When sampling water, use perfectly clean vessels and stoppers, and rinse each one several times with the water being sampled before finally filling. The water will be analysed, and a report made to the user stating any recommendations and/or precautions.

CURVING ROLLS

Experience indicates that a better and more even grip of the sheets is obtained if the flutes of the roll are slightly shallower than the flutes of the sheet. The reason for this is that the standard ¾" depth of corrugations includes twice the thickness of metal in the sheet. As curving is applied principally to 24G, the recommended depth of flute for the curving rolls is 11/16" bare (actually 43/64").

Corr. Galv. Steel Tanks in Common Use

Capacity of Tank Gallons	Height	Dia- meter	Walls 8/3" Corrugations Orb Sheets			Bottom & Roof Widths of 6' Sheets Q.H.	
			No.	Length	Gauge	Bottom 24G	Roof 26G
100	2' 0"	3' 2"	1	10' 0"	24	1-24"	1-24"
200	4' 0"	3' 2"	2	10' 0"	24	1-24"	1-24"
300	6' 0"	3' 2"	3	10' 0"	24	1-24"	1-24"
300 Squat	4' 0"	4' 0"	2	6' 0"	24	1-36"	1-36"
			2	7' 0"	24		
400	6' 0"	3' 8"	6	6' 0"	24	1-36"	1-36"
400 Squat	4' 0"	4' 4"	4	7' 0"	24	1-36"	1-36"
500	6' 0"	4' 0"	3	6' 0"	24	1-36"	1-36"
			3	7' 0"	24		
500 Squat	4' 0"	4' 11"	4	8' 0"	24	2-30"	2-30"
600	6' 0"	4' 4"	6	7' 0"	24	1-36"	1-36"
600 Squat	4' 0"	5' 3"	2	8' 0"	24	1-36"	1-36"
			2	9' 0"	24	1-30"	1-30"
800	6' 0"	5' 0"	6	8' 0"	24	1-36"	1-36"
					24	1-30"	1-30"
800 Squat	4' 0"	6' 3"	4	10' 0"	24	1-30"	1-30"
					24	2-24"	2-24"
1,000 Small	6' 0"	5' 7"	6	9' 0"	24	2-36"	2-36"
1,000 Full	6' 0"	5' 11"	3	9' 0"	24	2-36"	2-36"
			3	10' 0"	24		
1,000 Squat	4' 0"	6' 11"	4	11' 0"	24	1-36"	1-36"
						2-30"	2-30"
1,000 Squat	4' 0"	7' 4"	6	8' 0"	24	3-36"	3-36"
1,200	6' 0"	6' 3"	6	10' 0"	24	1-30"	1-30"
						2-24"	2-24"
1,500	6' 0"	7' 1"	3	7' 0"	24	2-30"	2-30"
			6	8' 0"	24	1-36"	1-36"
2,000	6' 0"	8' 3"	9	9' 0"	24	3-36"	3-36"
						1-30"	1-30"
3,000	6' 0"	10' 0"	3	9' 0"	24	6-36"	6-36"
			9	8' 0"	24		
4,000	6' 0"	11' 6"	6	10' 0"	24		
			6	9' 0"	24	7-36"	7-36"
5,000	6' 0"	13' 0"	9	9' 0"	24		
			6	8' 0"	24	9-36"	9-36"
10,000	6' 0"	18' 0"	18	10' 0"	22	36" wide	*
15,000	6' 0"	22' 6"	12	10' 0"	22	17-22G	
			12	9' 0"		26-22G	
20,000	6' 0"	25' 6"	15	10' 0"	22	32-22G	
				9' 0"			
30,000	6' 0"	32' 6"	33	10' 0"	20	50-20G	

*Above 2,000 gallons only 36"-wide sheets are considered.

As tanks of 10,000 gallons capacity and above are not usually provided with tops, no material is included in this data for same.

Lysaght TECT-A-TANK

Makes Tanks Last Longer —

Another Lysaght Achievement

As a result of years of research in the field of corrosion, Lysaght's have now produced a product which greatly increases the life of new galvanized steel tanks used for the storage of rain water. This product, known as Tect-A-Tank, has proved far superior to any previously known means of protection. Field trials have proved its value. It is particularly effective in areas subject to heavy down-pours where, due to the high purity of the water, it has been common in the past for a proportion of early failures to occur in untreated tanks. Its use is limited to new tanks, and the treatment is not suitable for bore, well or river waters.

Tect-A-Tank consists of a mixture of specially developed crystals packed in hygienic plastic tubes of two lengths, suitable for use in either tall or squat tanks. Each tube will treat any tank up to 1,500 gallons. For larger tanks an additional tube is used for each 1,000 gallons increase in capacity. Tect-A-Tank is easy to use. The tube is simply hung in the new tank before it starts to fill with rain water.

The crystals commence their work immediately any water enters the tank, and dissolve completely in six to nine months, forming a microscopic protective film on the interior, the effect of which will last for the life of the tank. Because of the design of the tube, full protection is afforded to the whole of the tank, whether filling takes place at once or in stages over a lengthy period. One application of Tect-A-Tank is sufficient to obtain a long tank life. The empty tube may be removed if desired, but is not harmful if left in the tank. Tect-A-Tank dissolved in rain water is harmless for drinking purposes, has no taste or odour, and does not affect the hardness of the water.

Fuller technical details on Tect-A-Tank can be provided on application to John Lysaght (Australia) Limited Branch Offices.

Tect-A-Tank is available from plumbers and hardware stores. If unobtainable locally, communicate with the offices of John Lysaght (Australia) Limited in the capital cities.

MISCELLANEOUS DATA

- 1 Cubic foot of distilled water at 62°F. weighs 62.321 lb. For all practical purposes, 62.5 lb.
- 1 Gallon of water weighs 10 lb.
- 1 Cubic foot = $6\frac{1}{4}$ gallons.
- 8 Gallons = 1 bushel. 1 Bag = 3 bushels.
- 1 Bushel is equivalent to 1.28 cubic feet of space.
- 1 Bushel of wheat weighs approximately 60 lb.
- 1 Bushel of oats weighs 40 lb.

ELECTRICAL STAMPINGS . .

for all requirements

SANKEY DIVISION OF JOHN LYSAGHT (Australia) LIMITED

GENERAL.—Sankey Division is associated with a world-wide organisation who for many years have specialised in the manufacture of stampings for the electrical industry. The Newcastle plant is one of the largest in the Southern Hemisphere capable of producing a great variety of stampings.

Electrical laminations are produced from a comprehensive range of special Australian silicon steels rolled and processed in Newcastle by John Lysaght (Australia) Limited. Details of these steels are shown on page 67.

ELECTRIC MOTORS.—The essential core of an electric motor is built up of a large number of thin stampings or laminations to form a stator and a rotor. Sankeys manufacture laminations for motors of 100 h.p. or more.

Most of these laminations are manufactured to customers' particular designs, but tools are also held in stock to produce a range of standard blank sizes, in which case slot details are supplied by the customer.

RADIO AND TELEVISION.—In every radio set there is at least one small transformer; in television sets there are several. These small transformers are relatively simple, consisting mainly of a stack of laminations in the form of E's and I's.

Sankey Division manufactures a large range of standard sizes of E and I laminations from $\frac{1}{4}$ " to 3" centre limb width.

LIGHTING.—Modern fluorescent lighting operates on a very low voltage, which necessitates the use of a special type of transformer called a ballast. The standard E-shape lamination is produced by Sankeys for this purpose, as well as other special shapes to customers' designs.

WOUND CORES.—In keeping with modern technological trends, Sankey Division offers a wide range of Wound Transformer Cores, mainly in the form of C Cores and Toroids. These are usually wound from grain-oriented silicon steel and, after being heat treated and impregnated, are cut and finished or lapped to provide two matched halves to fine limits of precision.

Enquiries are welcomed for the supply of small or large quantities of stampings, either from Sankey Division's standard range or to your own particular design. In the latter case, detailed and dimensioned drawings will facilitate quotation.

Please address your enquiries to John Lysaght (Australia) Limited, SANKEY DIVISION, Post Office, Newcastle, or to John Lysaght (Australia) Limited in all capital cities.

Fixing of Corrugated Galvanized Steel Sheets

GENERAL.—Of all building materials in common use, Lysaght Corrugated Galvanized Steel Sheet is one of the most popular, being adaptable for roofs, side walls, and vertical sheeting of all descriptions.

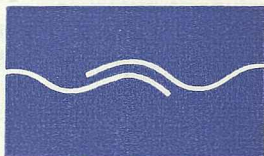
As is well known, corrugated steel sheet is produced in three pitches of corrugations, 5", 3", and 1", sometimes referred to as ripple iron. 3" pitch is that in most common use, and is produced in two widths, 8 x 3" and 10 x 3" corrugations.

When a corrugated sheet is placed flat and observed, it will be found that there are a number of crests and hollows. If these are counted there will be found to be more of one than the other. If there are more crests than hollows, then the sheet is the "right way" up. This side of the sheet should be bearing Lysaght's brand.

SIDE LAPS.—Sheets are said to be lapped one corrugation when both sheets are laid the right way up, and, as illustrated, the crest of one sheet fits over the crest of the other sheet. This lap is used for covering walls, or for roofs in dry areas.

Sheets are said to be lapped one and a half corrugations when sheets are laid with every second one up-side down, and with one crest and one hollow of each sheet matched. This is the standard lap for roofs. It is only used for wall sheeting where special protection from driving rain is required.

Sheets are said to be lapped two corrugations when two crests and one hollow of each sheet are matched, both sheets being the right way up. This is only required for special roof protection, e.g., low-pitched roofs such as awnings and lean-to's. The following table shows details of sheet sizes and coverages for the various side laps. In the following paragraphs we shall confine our remarks to the application of 3" corrugation steel sheet.



1 Corrug. Side Lap



1 1/2 Corrs. Side Lap



2 Corrs. Side Lap

COVERAGE

	8 x 3" Corr.	10 x 3" Corr.
Overall width of sheet	2' 1 1/2"	2' 7 1/2"
One corrugation lap	2' 0"	2' 6"
One and a half corrugations lap ..	1' 10 1/2"	2' 4 1/2"
Two corrugations lap	1' 9"	2' 3"

For estimating the number of sheets required for one side of a pitched roof, it is usual to divide the length of roof to be covered by the width of the corrugated sheet used, allowing the appropriate deduction for the side lap required—e.g., using 10 x 3" corrugations sheet, side lap one corrugation, length of roof 50'. Then number of sheets required = 20—i.e., $50 \div 2.5$. It is usual to add one sheet for wastage, making a total of 21.

PITCH OF ROOFS.—Corrugated steel sheets are suitable for pitches down to 5°, though a slope greater than 1 in 4 is preferred in snow country. For most Australian conditions slopes 1 in 4 and less are more pleasing to the eye.

END LAPS.—For pitches steeper than 1 in 4 use 6" end lap minimum; for pitches less than 1 in 4 use 9" end lap.

SIDING.—For siding use one corrugation side lap and 4" end lap.

FIXING OF SHEETS.—Sheets are fixed as follows:—

1. Roof sheets should be fixed through the top of every second corrugation at ends of sheets and every third corrugation at intermediate fixings.
2. Wall sheets should be fixed through the top of every third corrugation at end fixings and every fourth corrugation at intermediate fixings.
3. Where sheets span more than 3" between battens or purlins, it is advisable to fix the side lap at an intermediate point with a self-tapping screw or gutter bolt.

Following are details of the various nails, screws, etc., used for fixing corrugated sheeting.

GALVANIZED ROOFING NAILS.—Galvanized roofing nails are manufactured in lengths of 2" and 2½". They are normally purchased by the cwt. from manufacturers, but may be purchased by the pound in small quantities. For estimating purposes it may be assumed that a 1-lb. packet of 2½" contains 100 nails, and that approx. 70 nails or 1 lb. of nails are required for one square of roofing. Galvanized roofing nails are the most suitable for fixing roofing sheets to hardwood roof timbers.

GALVANIZED TWISTED-SHANK ROOFING NAILS.—Galvanized twisted-shank roofing nails are similar to the standard roofing nail, with the exception that the shank has been twisted in order to obtain a better grip in the timber roof members. They are manufactured in lengths of 2" and 2½", and are normally used where the roof timbers are oregon or cypress. These nails are purchased by the cwt. from the manufacturers, but can be obtained from local hardware stores in 1-lb. lots. Approximately 70 2½" roofing nails weigh 1 lb.

GALVANIZED ROOFING SCREWS.—Galvanized roofing screws are normally used in the softer roofing timbers such as oregon and cypress. Screws should be used in conjunction with lead or diamond galvanized sheet steel washers. For estimating purposes 70 screws and washers are required per 100 sq. ft. of roof area. $1\frac{3}{4}$ " screws can be used, though 2" are normal for 3" corrugations sheet.

$2\frac{1}{4}$ " and $2\frac{1}{2}$ " are required for 5" corrugations sheet.

$1\frac{3}{4}$ "—56 screws per lb., or $1\frac{1}{4}$ lb. per square of roofing.

2"—50 screws per lb., or 1.4 lb. per square of roofing.

Though lead washers may be used alone, it is preferable that they be accompanied by a steel washer.

An impregnated paper washer should be used in conjunction with diamond metal washers.

Lead washers are bought approximately 64 per lb.

GALVANIZED HOOK BOLTS.—Galvanized hook bolts are used in a variety of shapes to fix corrugated steel sheet to steel structural members. These are available in length from 4" to 6", width from $2\frac{1}{4}$ " to $\frac{3}{8}$ ". For estimating purposes it may be assumed that half a gross of bolts are required for each square of roofing. Hook bolts should be ordered 2" longer than the width of purlin or rafter with which they are to be used, and to have a minimum thread of $1\frac{1}{2}$ ".

When fixing, both edges of the sheet should be secured first to prevent the sheet spreading or becoming fan-shaped, which trouble may become more pronounced as the job progresses.

When sheeting roofs or walls, the sheets of iron should be fixed in threes, the two outer sheets placed either under or over the middle sheet for one and a half corrugations; the building will then be quite proof against rain or wind.

A corrugated iron roof will last longer if the ends and side laps of sheets are painted, before fixing, with zinc dust, red oxide, or any good quality roofing paint. These points of contact are where corrosion may begin.

Galvanized steel roofs should not be painted until the sheet has weathered—say six (6) months after erecting.

The development of metallic zinc dust paints has made possible the painting of new galvanized sheets without weathering or priming. The ingredients are obtainable from leading manufacturers, and the paint has a covering capacity of 420 sq. ft. per gallon if sprayed, and 445 sq. ft. if brushed.

RIDGING

To ensure the correct finish to the ridge of a roof, it is necessary to provide ridge capping, which may be either of the Standard or Ventilating type.

STANDARD RIDGE CAPPING (See Fig. 1).—Standard Ridge Capping (Ridge Capping with Roll) should be formed to the pattern as shown in Australian Standard Specification No. SPR3-1931. It will be found, however, that manufacturers in the various States may depart slightly from the standard pattern, but, in the main, the variation will be slight. When ordering various sizes of Ridge Capping, it should be noted that the size referred to is the width of the flat sheet from which the ridging is formed. The most popular sizes are 14" to 18", the 18" being used mainly for domestic construction, 14" to 16" being used for small sheds such as country farm structures.

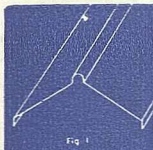


Fig. 1

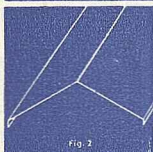


Fig. 2

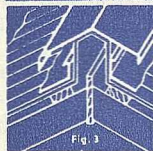


Fig. 3

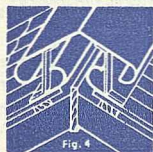


Fig. 4

Standard Ridge Capping should be of 24G Queen's Head Galvanized Steel Sheet or Zinc-anneal sheet, formed from the required width of sheet in 6' or 8' lengths—Fig. 1.

All Ridge Capping shall be securely fixed in conjunction with the roofing sheets with galvanized screws and lead washers or specially twisted galvanized roofing nails pierced through the top of every second corrugation and dressed well down into the corrugations.

PLAIN RIDGE CAPPING (See Fig. 2).—The plumber makes his own ridging, and normally forms it as a plain Ridge Capping without roll, as in Figure 2. This is prepared in lengths of 6' or 8' from 24G Queen's Head or Zinc-anneal flat sheet, and is applied to the roof in a similar manner as Standard Ridge Capping.

VENTILATING RIDGES.—Where it is necessary to obtain the maximum amount of ventilation in a building, it will be found that the application of a Ventilating Ridge will provide the requisite flow of air. Where it is desired to bird-proof ventilating ridges, $\frac{1}{2}$ " galvanized wire mesh should be soldered to underside of Ridge Capping, taken down behind flashing, and either soldered to flashing or fixed to roof batten—Figs. 3 and 4.

EAVES GUTTERS OR SPOUTING

The chief types of Eaves Gutters (alternatively called spouting) are as illustrated. With few exceptions, common practice is to use the standard quadrant type (Fig. 1). Though the shape of this is set out in Australian Standard Specification SPRI3-1931, a number of manufacturers still fabricate quadrant guttering (or spouting) to their own particular pattern. Where replacements have to be made of small lengths of guttering to old buildings, then the material is formed to a pattern conforming to the existing installation.

STANDARD EAVES GUTTERS (OR SPOUTING).—

Eaves gutters of the type and size selected should be formed from 24G Queen's Head Galvanized or Zincanneal R.L. flat sheet in 6' or 8' lengths, fixed in position with required falls to outlets; lapped, double riveted, and soldered at joints. Cut gutters to receive thimble connection of downpipes and properly solder at these junctions.

EAVES GUTTERS FIXING.— Eaves gutters can be fixed to the eaves with a variety of straps or brackets according to the method of fixing and type of bracket or gutter selected.

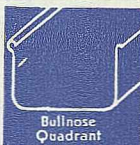
Brackets can be fixed:—

- (a) To fascia boards with galvanized nails.
- (b) To rafters with galvanized nails.
- (c) In all-steel constructions to corrugated roofing sheets with galvanized bolts, nuts, and washers.

Brackets are formed from 16G galvanized strip and fastened over or on to the guttering.

In general, straps are bent over the lip of the gutter. To support the gutters against heavy snow or leaf loads, handling of gutters when cleaning, etc., an overstrap can be provided to fasten on to the rafters. Constructions exist using a distance tube and spike, or in which the bracket is riveted or attached by a nut and washer to the guttering.

SIZE OF GUTTERS. — The size of the gutter necessary will depend upon the size and number of downpipes necessary to carry away the maximum rainfall from any given roof. The size of the gutter should be such that the entry of the downpipe will fit snugly into the bottom of the gutter, and will not project up the outer face. Galvanized crimp wire gratings must be provided at all downpipe outlets.



DOWNPIPES

GENERAL.—Downpipes are formed from 24G Queen's Head Galvanized or Zincanneal R.L. flat sheets in 6' or 8' lengths. The longitudinal joint may be formed with a $\frac{3}{8}$ " seamed joint, or alternatively lapped $\frac{1}{4}$ " and soldered.

TYPES.—Downpipes may be of round or rectangular section. The normal range of round downpipes is from 2"-6" dia., 3" being the usual size for cottage construction, 4" for farm sheds, while 5" and 6" sizes are generally confined to factory buildings. The downpipes may be formed from tapered strips, so that one end is slightly larger than the other, to allow lengths of downpipes to be fitted together, or alternatively one end of the pipe can be crimped.

ROUND				RECTANGULAR			
Dia. inches	Area sq. in.	Roof area drained sq. ft.	Area of building roofed sq. ft.	Size of Piping inches	Area sq. in.	Roof area drained sq. ft.	Area of building roofed sq. ft.
2"	3.14	314	304	3" x 2"	6	600	582
2½"	4.9	490	475	4" x 2"	8	800	775
3"	7.07	707	686	4" x 3"	12	1,200	1,165
4"	12.56	1,256	1,218	4" x 4"	16	1,600	1,555
5"	19.63	1,963	1,905	5" x 4"	20	2,000	1,940
6"	28.27	2,827	2,742	6" x 4"	24	2,400	2,315

SIZE OF DOWNPIPES.—For every 100 square feet of actual roof area drained, 1 sq. inch of downpipe is required, whether round or square. This calculation is based on the assumption that the maximum rainfall does not exceed 5" per hour.

It is considered the best practice to drain to different points, using smaller downpipes, rather than to one large outlet. Where possible, downpipes should be spaced at not more than 40' centres.

FIXING OF DOWNPIPES.—Downpipes may be secured:—

1. To weatherboards with 16G galvanized or Zincanneal straps.
2. To brickwork joints with galvanized steel wall hooks, one to each length of downpipe, or with 16G iron straps fixed to wall blocks with galvanized screws and washers.

For additional holding capacity 16G galvanized steel straps can be soldered to the downpipe and fixed to the downpipe together with a self-tapping screw through the middle of the bracket.

3. To corrugated iron wall siding sheets with 16G straps bolted to the sheet with a pair of 3/16" galvanized gutter bolts and washers.

Downpipes should be blocked out 1" clear of all walls and painted prior to fixing.

When buildings are erected on the boundary of a street alignment, the lower length of downpipe should be of cast iron, and chased into the outside face of the building for a minimum length of 6 feet.

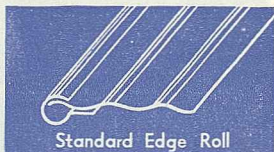
SOLDERING.—Downpipes are fitted so that the lower length fits inside the upper lengths some 1½"-2". Joints are sweated and soldered.

Finishes — Edge Rolls — Barge Boards

STANDARD EDGE ROLL:

To ensure a perfect finish to the end of a corrugated sheet roof, an **EDGE ROLL** should be used.

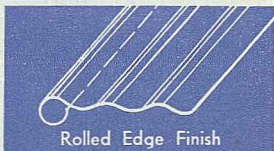
This may be obtained through any merchant.



Standard Edge Roll

ROLLED EDGE FINISH:

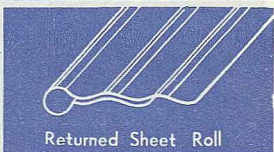
Where an **EDGE ROLL** is unavailable, a suitable finish may be formed by rolling the last corrugation of a sheet around a pipe of suitable diameter.



Rolled Edge Finish

RETURNED SHEET ROLL:

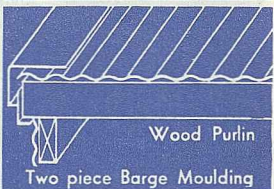
Where portion of a sheet remains after the roof has been fixed, the simplest edge finish is to return the corrugated sheet upon itself, as shown, to form a returned sheet roll.



Returned Sheet Roll

BARGE FINISH:

A barge finish, which may be preferred to an edge roll, is a two-piece barge moulding formed from 24-gauge flat sheet as illustrated.



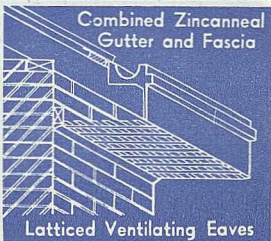
Wood Purlin

Two piece Barge Moulding

COMBINED EAVES GUTTER AND FASCIA:

The combined eaves gutter and fascia shall be of 24G Queen's Head Galvanized Steel Sheet or Zincanneal.

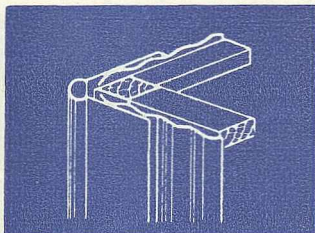
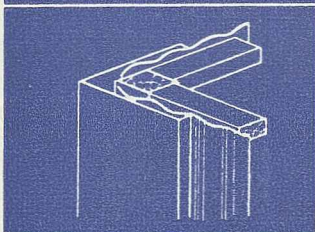
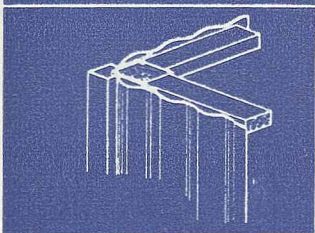
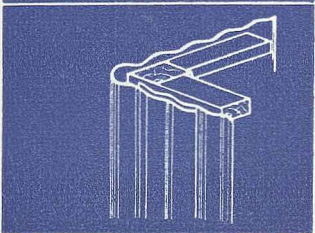
The latticed ventilating eaves soffit can be formed from 1" wide strips of 26G Queen's Head, interlaced and riveted or soldered at certain joints.



Combined Zincanneal Gutter and Fascia

Latticed Ventilating Eaves

STANDARD CORNER FINISHES



Walls of Corrugated Galvanized Steel Sheet or Zinc-anneal fixed vertically may be finished at the corners in a variety of ways, as shown in the illustration.

STANDARD RIDGING. — When using standard or plain ridging, sheeting need not completely cover the side of the buildings, but may be one or two corrugations short of the length of the building, so that the capping laps over the corrugated sheet at least 3".

PLAIN RIDGING.—Plain ridging may be fixed in a similar manner to standard ridging.

SPECIAL CORNER MOULDS. — Special corner finish mouldings may be constructed from 24G Queen's Head or Zinc-anneal R.L. sheets in 6' or 8' lengths. These are fastened to the corner posts in conjunction with corrugated sheets by galvanized roofing nails or screws and washers.

RETURN SHEET.—Sheets can be corner finished by taking one corrugated sheet round the corner and over the adjacent sheet to give a minimum of one and a half corrugations side lap.

ROOF DRAINAGE OF CORRUGATED GALVANIZED STEEL ROOFS

The following tables show calculated sizes of box gutters and downpipes necessary to provide efficient run-off of rain water.

The figures given in these tables are based on the assumption that the distance between downpipes does not exceed 40', and that box gutters are laid with a maximum fall of 1" in 30' and a minimum fall of 1" in 60'.

The roof area drained is the product of the distance between downpipes (40') and the length of the roof slope (gutter to ridge).

ROOF DRAINAGE DETAILS FOR MAXIMUM RAINFALL INTENSITY OF 5" PER HOUR

Roof area Drained (sq. ft.)	Downpipes Area (sq. in.)	Diameter (inches)	Box Gutter Size (inches) Width x Depth
400	4	2½"	5" x 3½"
800	8	3½"	6½" x 4½"
1,200	12	4"	8" x 5"
1,600	16	4½"	9" x 5½"
2,000	20	5"	9½" x 6"
2,400	24	5½"	10" x 6½"
2,800	28	6"	10½" x 7"
3,200	32	6½"	11" x 7½"
3,600	36	7"	12" x 7½"
4,000	40	7½"	12" x 8"

RAINFALL INTENSITY OF 18" PER HOUR

Roof area Drained (sq. ft.)	Downpipes Area (sq. in.)	Diameter (inches)	Box Gutter Size (inches) Width x Depth
400	14.4	4½"	9" x 5"
800	28.8	6"	11" x 7"
1,200	43.2	7½"	12" x 8½"
1,600	57.6	8½"	14" x 9"
2,000	72	9½"	16" x 9½"
2,400	86.4	10½"	17" x 10"
2,800	100.8	11½"	18" x 11"
3,200	115.2	12"	19" x 11½"
3,600	129.6	13"	19½" x 12"
4,000	144	13½"	20" x 12½"

VARIATION OF ROOF AREA WITH SLOPE

Classification	Incline		Inclined area per sq. ft. horizontal area	Percentage increase in area over flat roof
	In. per ft. horizontal	Angle with horizontal		
Flat roofs	$\frac{1}{8}$	0° 36'	1.000	0.0
	$\frac{1}{4}$	1° 12'	1.000	0.0
	$\frac{3}{8}$	1° 47'	1.000	0.0
	$\frac{1}{2}$	2° 23'	1.001	0.1
	$\frac{5}{8}$	2° 59'	1.001	0.1
	$\frac{3}{4}$	3° 35'	1.002	0.2
	1	4° 46'	1.003	0.3
	$1\frac{1}{8}$	5° 21'	1.004	0.4
	$1\frac{1}{4}$	5° 57'	1.005	0.5
	$1\frac{1}{2}$	7° 08'	1.008	0.8
	$1\frac{3}{4}$	8° 18'	1.011	1.1
	2	9° 28'	1.014	1.4
Steep roofs	$2\frac{1}{4}$	10° 37'	1.017	1.7
	$2\frac{1}{2}$	11° 46'	1.021	2.1
	$2\frac{3}{4}$	12° 54'	1.026	2.6
	3	14° 02'	1.031	3.1
	$3\frac{1}{4}$	15° 09'	1.036	3.6
	$3\frac{1}{2}$	16° 16'	1.042	4.2
	$3\frac{3}{4}$	17° 21'	1.048	4.8
	4	18° 26'	1.054	5.4
	$4\frac{1}{4}$	19° 30'	1.061	6.1
	$4\frac{1}{2}$	20° 34'	1.068	6.8
	5	22° 37'	1.083	8.3
	6	26° 34'	1.118	11.8
	7	30° 16'	1.158	15.8
	8	33° 42'	1.202	20.2
	9	36° 52'	1.250	25.0
	10	39° 48'	1.302	30.2
	11	42° 31'	1.356	35.6
	12	45° 00'	1.414	41.4
Extra steep roofs	14	49° 24'	1.537	53.7
	16	53° 08'	1.667	66.7
	18	56° 19'	1.803	80.3
	20	59° 02'	1.943	94.3
	22	61° 23'	2.088	108.8
	24	63° 26'	2.235	123.5

ROOF TIMBERS (A.S. No. O-56—1948)

RAFTERS FOR SHEET ROOFS—SINGLE SPAN

Cross-sectional Diameter—Inches

Spacing in.	Span ft.	Groups A & B		Group C		Group D
		Standard Grade	Common Grade	Standard Grade	Common Grade	Standard Grade
18	4	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	5	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	6	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	7	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	8	3 x 2	3 x 2	3 x 2	3 x 2	4 x $\frac{1}{2}$
	9	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$
	10	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x 2	4 x 2	5 x $\frac{1}{2}$
	11	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$
24	4	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	5	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	6	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	7	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x 2	3 x 2
	8	3 x 2	3 x 2	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$
	9	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x 2	4 x 2
	10	4 x 2	4 x 2	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$
	11	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$	5 x 2	5 x 2
30	4	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	5	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	6	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x 2	3 x 2
	7	3 x $\frac{1}{2}$	3 x 2	3 x 2	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$
	8	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x 2	4 x $\frac{1}{2}$
	9	4 x $\frac{1}{2}$	4 x 2	4 x 2	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$
	10	4 x 2	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$	5 x $\frac{1}{2}$	5 x 2
	11	5 x $\frac{1}{2}$	5 x 2	5 x 2	6 x 2	6 x 2
36	4	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	5	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	6	4 x $\frac{1}{2}$	3 x 2	3 x 2	3 x 2	3 x 2
	7	3 x 2	4 x $\frac{1}{2}$	4 x $\frac{1}{2}$	4 x 2	4 x 2
	8	4 x $\frac{1}{2}$	4 x 2	4 x $\frac{1}{2}$	4 x 2	4 x 2
	9	4 x 2	4 x 2	5 x $\frac{1}{2}$	5 x 2	5 x 2
	10	5 x $\frac{1}{2}$	5 x 2	5 x $\frac{1}{2}$	6 x 2	5 x 2
	11	5 x $\frac{1}{2}$	5 x 2	6 x 2	6 x 2	6 x 2
48	4	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$	3 x $\frac{1}{2}$
	5	3 x $\frac{1}{2}$	3 x 2	3 x $\frac{1}{2}$	4 x $\frac{1}{2}$	3 x 2
	6	3 x $\frac{1}{2}$	4 x $\frac{1}{2}$	3 x 2	5 x 2	4 x $\frac{1}{2}$
	7	4 x $\frac{1}{2}$	5 x 2	4 x $\frac{1}{2}$	5 x 2	4 x 2
	8	4 x $\frac{1}{2}$	5 x 2	4 x 2	6 x 2	5 x 2
	9	5 x 2	6 x 2	5 x 2	6 x 2	5 x 2
	10	5 x 2	6 x 2	5 x 2	—	6 x 2
	11	6 x 2	—	6 x 2	—	7 x 2

ROOF TIMBERS (A.S. No. O-56—1948)

PURLINS FOR SHEET ROOFS—SINGLE SPAN

Cross-sectional Dimensions—Inches

Spacing in.	Span ft.	Groups A & B		Group C		Group D
		Standard Grade	Common Grade	Standard Grade	Common Grade	Standard Grade
30	10	4 x 2	5 x 1½	5 x 1½	5 x 2	5 x 1½
	11	5 x 1½	5 x 2	5 x 2	6 x 2	6 x 2
	12	5 x 2	5 x 2	6 x 2	6 x 2	6 x 2
	13	6 x 2	6 x 2	6 x 2	6 x 3	6 x 3
	14	6 x 2	6 x 2	6 x 3	6 x 3	7 x 3
	15	6 x 3	6 x 3	7 x 3	6 x 3	7 x 3
	16	7 x 3	6 x 3	7 x 3	—	8 x 3
	17	7 x 3	—	8 x 3	—	8 x 3
	18	8 x 3	—	9 x 3	—	9 x 3
	19	8 x 3	—	9 x 3	—	9 x 3
	20	9 x 3	—	10 x 3	—	10 x 3
36	10	5 x 1½	5 x 2	5 x 1½	6 x 2	5 x 2
	11	5 x 1½	5 x 2	6 x 2	6 x 2	6 x 2
	12	6 x 2	6 x 2	6 x 2	6 x 2	6 x 2
	13	6 x 2	6 x 2	6 x 3	6 x 3	6 x 3
	14	6 x 3	6 x 3	7 x 3	6 x 3	7 x 3
	15	7 x 3	6 x 3	7 x 3	—	7 x 3
	16	7 x 3	6 x 3	8 x 3	—	8 x 3
	17	8 x 3	—	8 x 3	—	9 x 3
	18	8 x 3	—	9 x 3	—	9 x 3
	19	9 x 3	—	9 x 3	—	10 x 3
	20	9 x 3	—	10 x 3	—	10 x 3
42	10	5 x 1½	5 x 2	5 x 2	6 x 2	6 x 2
	11	5 x 2	6 x 2	6 x 2	6 x 2	6 x 2
	12	6 x 2	6 x 2	6 x 2	6 x 3	6 x 3
	13	6 x 2	6 x 3	6 x 3	6 x 3	7 x 3
	14	6 x 3	6 x 3	7 x 3	—	7 x 3
	15	7 x 3	6 x 3	7 x 3	—	8 x 3
	16	7 x 3	—	8 x 3	—	8 x 3
	17	8 x 3	—	8 x 3	—	9 x 3
	18	8 x 3	—	9 x 3	—	9 x 3
	19	9 x 3	—	10 x 3	—	10 x 3
	20	9 x 3	—	10 x 3	—	10 x 3
48	10	5 x 2	6 x 2	5 x 2	6 x 2	6 x 2
	11	5 x 2	6 x 2	6 x 2	6 x 3	6 x 2
	12	6 x 2	6 x 3	6 x 2	6 x 3	6 x 3
	13	6 x 3	6 x 3	6 x 3	—	7 x 3
	14	6 x 3	6 x 3	7 x 3	—	7 x 3
	15	7 x 3	—	8 x 3	—	8 x 3
	16	8 x 3	—	8 x 3	—	8 x 3
	17	8 x 3	—	9 x 3	—	9 x 3
	18	9 x 3	—	9 x 3	—	10 x 3
	19	9 x 3	—	10 x 3	—	10 x 3
	20	10 x 3	—	10 x 3	—	11 x 3

Properties of Sawn Timber Sections

Size in.	Area sq. in.	Section Modulus	Size in.	Area sq. in.	Section Modulus
2 x 3	4	1.9	10 x 10	90	143
2 x 4	6	3.6	10 x 12	109	209
2 x 6	9	8.6	10 x 14	128	288
2 x 8	12	15	10 x 16	147	380
2 x 10	15	24	10 x 18	166	484
2 x 12	19	36	10 x 20	185	602
			10 x 22	204	731
3 x 6	15	14	10 x 24	223	874
3 x 8	20	24	10 x 26	242	1,030
3 x 10	25	40			
3 x 12	30	58	12 x 12	132	253
3 x 14	35	80	12 x 14	155	349
			12 x 16	178	460
4 x 4	13	8	12 x 18	201	587
4 x 6	20	20	12 x 20	224	728
4 x 8	27	34	12 x 22	247	886
4 x 10	34	55	12 x 24	270	1,058
4 x 12	42	80	12 x 26	293	1,246
4 x 14	49	110	12 x 28	316	1,449
4 x 16	56	145	12 x 30	339	1,668
6 x 6	30	28	14 x 14	182	410
6 x 8	41	52	14 x 16	209	540
6 x 10	52	83	14 x 18	236	689
6 x 12	63	121	14 x 20	263	855
6 x 14	74	167	14 x 22	290	1,040
6 x 16	85	220	14 x 24	317	1,243
6 x 18	96	280	14 x 26	344	1,463
6 x 10	107	475	14 x 28	371	1,702
			14 x 30	398	1,958
8 x 8	56	70	14 x 32	425	2,223
8 x 10	71	113			
8 x 12	86	165	16 x 16	240	620
8 x 14	101	227	16 x 18	271	791
8 x 16	116	300	16 x 20	302	982
8 x 18	131	382	16 x 22	333	1,194
8 x 20	146	475	16 x 24	364	1,427
8 x 22	161	578	16 x 26	395	1,463
8 x 24	176	690	16 x 28	426	1,702

Table of Thermal Conductivities of Building Materials

Material	Description	Density lb. per cu. ft.	Con- duc- tivity K.	Res't'ce R for Thick- ness listed or 1"
Air Space:	Horizontal $\frac{3}{4}$ "-4"	—	—	0.82
	Vertical $\frac{3}{4}$ "-4"	—	—	0.92
Air Surfaces:	Still—Horizontal	—	—	0.61
	Vertical	—	—	0.68
	15 m.p.h. H. or V.	—	—	0.17
Building Boards:	Gypsum Board $\frac{3}{8}$ "	58	1.39	0.27
	Plywood $\frac{1}{4}$ "	34	—	0.31
Flooring Materials:	Carpet and U/felt	—	—	2.08
	Ceramic Tile 1"	—	—	0.08
	Lino $\frac{1}{8}$ "	—	—	0.05
	Plastic Tile $\frac{1}{8}$ "	110	6.25	0.02
	Terrazzo 1"	—	—	0.08
	Hardwood $\frac{3}{4}$ "	—	—	0.68
Insulating Materials:	Mineral Wool (Glass, Slag or Rock)	2.0-5.0	0.30	3.33
	Glass Fibre	9.5	0.25	4.00
	Cane Fibre Tile $\frac{3}{4}$ "	10.5	—	3.16
	Esterfoam	1.62	0.29	3.45
	Asbestos Fibre (Spray) ..	6.0	0.32	3.13
				
Roof Insulation: (For use above deck):	Cane Fibre $\frac{1}{2}$ "	16.0	0.35	1.39
	Cane Fibre 1"	16.0	0.35	2.78
	Cane Fibre 2"	16.0	0.35	5.26
Concretes:	Gypsum Mortar	116	5.00	0.20
	L.W. Aggregates	120	5.20	0.19
	Including:			
	Shale	100	3.60	0.28
	Slate, Slag	80	2.50	0.40
	Pearlite	60	1.70	0.59
	Vermiculite and Cellu- lar Concretes	40	1.15	0.86
	Sand, Gravel + Stone ..	140	12.0	0.08
Brick:	Common	120	5.00	0.20
	Face	130	9.00	0.11
Plaster:	Cement + Sand $\frac{1}{2}$ "	116	5.0	0.10
	Gypsum + Sand $\frac{1}{2}$ " ..	105	—	0.09
Woods:	Hardwoods	45	1.10	0.91
	Softwoods	32	0.80	1.25

HEAT TRANSMISSION THROUGH BUILDINGS

Heat transfer through buildings depends on the thermal conductivity of the components which form the enclosing units of that building.

Thermal Conductivity, K , is the time rate of heat flow through a given homogeneous material, and is expressed in B.t.u./hr./sq. ft. °F./1" thickness.

The overall coefficient of heat transmission, U , is the time rate of heat flow from air to air through the various materials used to construct walls, roofs or floors. U is expressed in B.t.u./hr./sq. ft./°F.

The Thermal Resistance, R , is the reciprocal of the overall coefficient, U , for a particular construction. Thus resistances are additive, i.e., $R_{\text{Total}} = R_1 + R_2 + \dots + R_n$, where $R_1, R_2, \dots, R_n$ are the individual resistances of the components.

EFFECT OF ROOFING ON INTERNAL TEMPERATURES

The rate of heat-flow through the roofing membrane depends on its thermal conductivity and its thickness. Heat flows through a 24-gauge galvanized steel roofing sheet 1,500 times and 1,000 times more rapidly than through a terra cotta tile $\frac{1}{2}$ " thick, and only one-quarter as fast as through an aluminium sheet of the same thickness. This fact, as shown later, has very little bearing on the thermal resistance of a roof.

From the underside of the roofing membrane, heat is transferred to the cooler interior of the building by three processes:—

- (i) **Conduction:** Heat is transferred to the roof frame and thence to the remainder of the structure through the purlins or battens. Only a very small quantity of heat is transferred in this manner.
- (ii) **Convection:** Heat is transferred to cool air in contact with the underside of the roof. This heated air circulates throughout the inside of the structure and, in turn, heats surfaces at cooler temperatures.
- (iii) **Radiation:** Heat radiates from the hot roof to cooler surfaces below.

The rate of heat-flow by convection and radiation from the underside of the roof is reduced to a very small proportion of its rate of flow through the roofing material by the surface air film between the sheet and the surrounding air. This rate of flow through this surface film is constant, being independent of the roofing material.

G.K.N. — LYSAGHT PTY. LTD.

Sales Divisions:

MILLS SCAFFOLDS

WILLIAMS FORM HARDWARE

UNISTRUT

AGENCIES

Branch Offices:

SYDNEY: 410-416 Mitchell Road,
Alexandria.

MELBOURNE: 78 Bay Street,
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BRISBANE: 10-14 Graham Street,
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ADELAIDE: Cnr. Adam and
Manton Streets, Hindmarsh.

PERTH: 35 Forbes Road, Perth.

CANBERRA: 7 Whyalla Street,
Fyshwick.

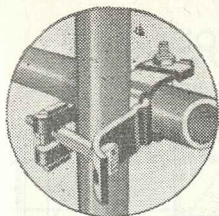
NEWCASTLE: John Lysaght
(Australia) Limited Newcastle
Works.

PORT KEMBLA: John Lysaght
(Australia) Limited, Port
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GEELONG: Station Street, Nor-
lane.

HOBART: Brewster Scaffolds
Pty. Ltd., 164 Campbell
Street, Hobart.

And agents in New Zealand and major country centres
in Australia.

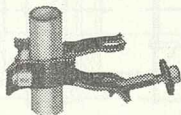


MILLS

TUBULAR SCAFFOLDING

MILLS Tubular Scaffolding is erected with steel or aluminium tube and patented scaffold fittings.

MILLS Fittings are made from hardened and tempered spring steel, with galvanized bolts and nuts. They are subject to severe tests during manufacture, and are proved capable of carrying loads far in excess of normal practice.

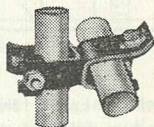
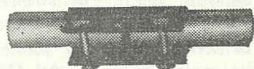


NINETY-DEGREE CLIP

The standard connection for crossing tubes at right angles and the main load-bearing fitting.

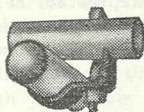
SWIVEL CLIP

The fitting used for connecting tubes at any angle other than 90°, and also for forming lap joints in tubes subject to tensional stress.



END-TO-END COUPLER

Used for joining tubes end to end, where subject to compression, or little or no tensional stress.



PUTLOG CLIP

Used for light connections at right angles where the load is fully carried by structural members: e.g., for fastening putlog tubes to ledgers.



BASE PLATE

To carry the bases of columns in all cases where distribution of the load is required.



REVEAL PIN

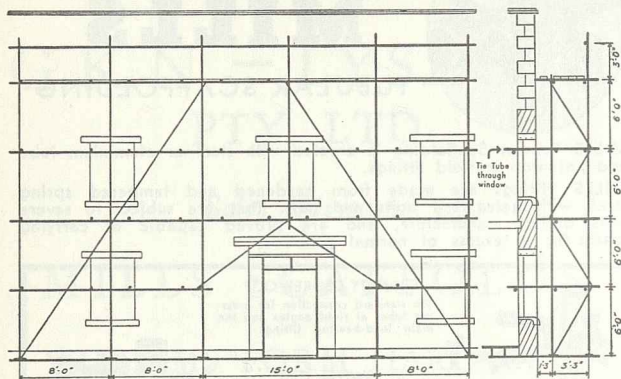
Used for bridging between window openings, on builders' scaffolding and where dead-length columns are required.



BLADE-ENDED PUTLOG TUBE

Used in bricklayers' scaffolds. Leaves only a small hole when withdrawn from the brickwork.

INDEPENDENT SCAFFOLD

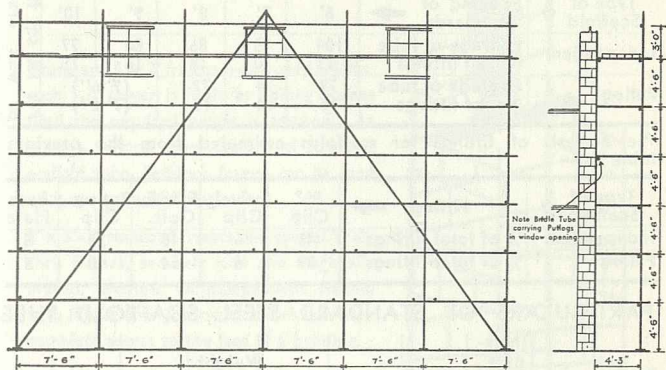


Sometimes called the double scaffold, since it incorporates two rows of uprights or standards, and is not dependent on the building itself in any way as a factor in the carrying of loads. For normal work, the standards are placed in pairs 3' 3" or 4' 0" apart (to provide a platform the width of four or five 9" scaffold planks between standards), the distance between pairs being 6' to 10'.

INTERNAL SCAFFOLD

Such a scaffold may be used for access to the ceilings and walls of a large room, cinema or theatre auditorium, or any other structure where the construction or maintenance requires access to points which are not available from ground level. The arrangement of the scaffold can be made to suit the particular work in hand, but for normal use, when such a scaffold is required as a working platform only, and not for carrying heavy loads, the uprights or standards are placed at 8' to 10' centres in each direction, and lifts are spaced at 6' intervals. These scaffolds, which are sometimes referred to as "birdcage" scaffolds, require adequate bracing to prevent movement.

PUTLOG SCAFFOLD



Sometimes called the single scaffold, as against the independent or double scaffold. In this construction, one end of the putlog is fixed between the courses of brickwork, the other end to the standard by 90° clip, or else to the ledger by Putlog clip. For normal work, the standards are placed at intervals of 7' 6", and the lifts or working platforms at intervals to suit the job. A minimum amount of bracing is required, since use is made of the wall itself. The scaffold can be rapidly erected as the work progresses if provision is made for the putlogs while the brickwork is green.

SPECIAL USES

"Mills" Scaffolding is also widely used for supporting concrete slab and wall formwork, and for an endless variety of structures, including stationary and mobile towers, temporary and semi-permanent buildings, storage racks, fun fair units, loading stages, temporary seating, grandstands, workshops, garages, jetties, foot bridges, and platforms. "Mills" trained staff will design a tubular structure to suit any purpose.

ESTIMATING DATA

The approximate quantities of tube and fittings required for standard scaffolds are:—

Type of Scaffold ↓	Spacing of Standards →	6'	7'	8'	9'	10'	Per 100 sq. ft. of wall area
Independent	Footage of tube	104	95	86	80	77	
	No. of fittings	23	20	18	16	15	
Putlog	Footage of tube	79	74	72	(7' 6")		
	No. of fittings	15	14	13	(7' 6")		

The analysis of fittings for scaffolds estimated from the previous table is:—

Type of Scaffold ↓	Fittings →	90° Clip	Swivel Clip	E. to E. Cplr.	Putlog Clip	Base Plate
Independent	% of total fittings	46	6	15	28	5
Putlog	% of total fittings	39	4	14	40	3

PARTICULARS OF STANDARD STEEL SCAFFOLD TUBE

Trade Name	Gge.	Thick-ness of metal	I.D.	O.D.	Area sq. in.	Weight per ft. lb.	I	Z	K
2"	6	.192"	1.525"	1.909"	1.036"	3.516	.3866"	.405"	.611"

LOADING DATA FOR TUBULAR STEEL STRUCTURES

LEDGERS OR TRANSOMS					COLUMNS OR STRUTS	
Clear Spans in feet	Safe Concentrated Load at centre of Span lbs.	Safe Distributed Load evenly distributed lbs.	Safe Concentrated Load at end of Cantilever lbs.	Safe Distributed Load on Cantilever lbs.	Unsup-ported Height in ft.	Safe Load for Welded Tube in tons
1	2430	4860	608	1216	1	5.46
2	1215	2430	304	608	2	5.27
3	810	1620	202	404	3	4.94
4	607	1214	152	304	4	4.49
5	486	972	121	242	5	3.91
6	405	810	101	202	6	3.20
7	347	694	87	174	7	2.41
8	303	606	76	152	8	1.84
9	270	540	67	134	9	1.46
10	243	486	—	121	10	1.18
11	221	442	—	110	11	.97
12	202	404	—	101	12	.82

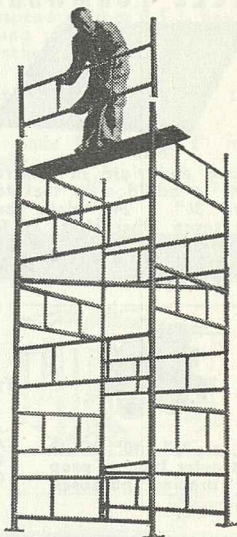
Dotted lines indicate practical limits of safety for general use.
Safe Load on "Mills" 90° or Swivel Clip, 2,800 lbs.

MILLS SELF-LOCK SCAFFOLD SYSTEM

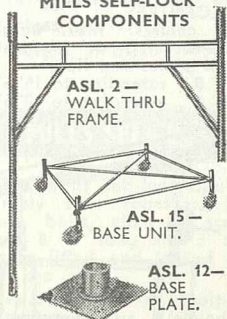
Standard 5' x 2' frames weigh only 37½ lbs. each. A tower is built by adding frames until the required height is reached. As outside vertical members are of standard scaffold tube, Self-lock frames can be used with normal scaffolding.

5' x 3'-3" standard frames and special Walk thru frames, securely tied and diagonally braced, provide an independent scaffold with lifts at 6'-6" intervals. Workmen have complete access to the face of a building.

The frames just slot into each other. There are no fittings to do up.



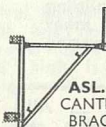
MILLS SELF-LOCK COMPONENTS



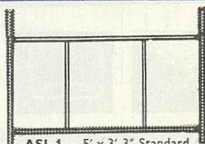
ASL. 13 — JACKING BASE.



ASL. 16 — CANTILEVER BRACKET.



ALSO — ASL. 14 — Handrail Post
ASL. 17 — Board Bearer.



ASL.1 — 5' x 3' 3" Standard Frame. Also: ASL.3 — 5' x 2' Standard Frame; ASL.4 — 2' x 3' 3" Frame; ASL.5 — 2' x 2' Frame.

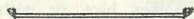
HORIZONTAL BRACES

ASL.9 — 5' x 5' Plan Brace.
ASL.11 — 5' x 2' Plan Brace.

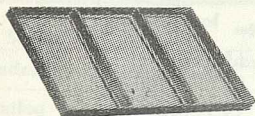


TIE BARS

ASL. 6 — 5 FEET
ASL. 7 — 2 FEET

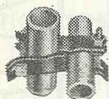


MILLS STEEL FORMWORK



MILFORM

Strong and rigid in construction. In addition to the standard 36" x 24" plate there are seven other sizes, as follows:—24" x 24", 36" x 21", 24" x 21", 36" x 9", 24" x 9", 36" x 6", 24" x 6".

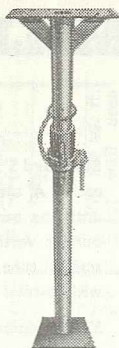


2" x 2 $\frac{3}{8}$ " 90° CLIP
Fits outer tube of prop
for bracing purposes.



MILPROP AND BEAMPROP

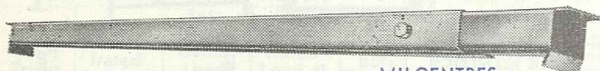
"Mills" expanding Props cover a range from 6' to 15', with three types.



SPECIFICATION FOR MILPROP AND BEAMPROP

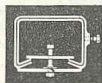
Type	Height		Appr. Wght. in lb.	Collapsing Load in tons	
	Fully Closed	Fully Extnd.		Fully Closed	Fully Extnd.
A	6' 0"*	10' 6"	53	11.40	8.63
B	8' 0"	12' 6"	60	10.15	7.25
C	10' 6"	15' 0"	69	7.87	3.80

*6' 6" for Beamprop.



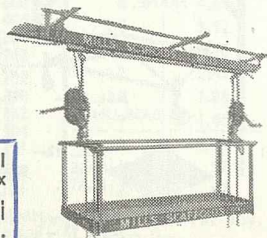
MILCENTRES

Lightweight floor centres. Max. weight only 84 lbs. Constructed of $\frac{1}{8}$ " plate with $\frac{1}{4}$ " end plates and lips.
LARGE: Closed 8' 0", extending to 15' 6".
SMALL: Closed 4' 6", extending to 8' 6".



MILLS TRAVELLING CRADLE

Saves time and cuts rigging costs. The painter can traverse a building horizontally and thus avoid many weary hours of raising and lowering fixed stages.



AVAILABILITY AND SERVICE. — All "Mills" Scaffolding is available ex stock for hire or outright purchase, and teams of trained scaffolders will erect any job at shortest notice.

MILLS HEAVY SUSPENDED SCAFFOLDING

The 5' 0" wide working platform is suspended from R.S.J. needles located at 10' 0" centres on the building roof. The working platform is operated by two 1,600 lb. winches suspended from each needle.

Each needle is 7" x $3\frac{1}{2}$ " x 15 lb. per ft. R.S.J. A $\frac{1}{2}$ " dia. stop bolt prevents the rope attachment from sliding off.

The rope anchor (or attachment) is made from 2" x $\frac{3}{8}$ " mild steel, and wraps around the R.S.J. needle.

The cradle frame is fabricated from $2\frac{1}{2}$ " x $2\frac{1}{2}$ " x $\frac{5}{16}$ " angle.

ADJUSTABLE TRESTLES

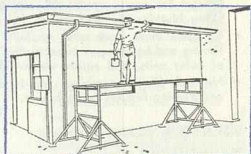
LARGE TRESTLE:

Height (fully extended), 8' 0".

Height (fully collapsed), 5' 0".

Extension every 6".

Weight, 88½ lbs.



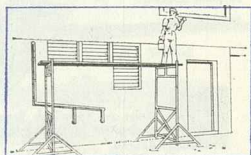
SMALL TRESTLE:

Height (fully extended), 5' 9".

Height (fully collapsed), 2' 9"
(with board on lower bearer tube).

Extension every 6".

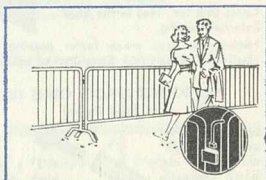
Weight, 77 lbs.



MILLS SELF-LOCK CONTROL BARRIERS

The Mills Self-lock Control Barrier simply slots together. It has no nuts, bolts, clips or screws. Each unit, 8' 6" long and 3' 8" high, is easily lifted and locked in position by one man.

Interlocking is foolproof. The frames can be coupled and uncoupled only when they are placed at a 30-degree angle to each other.



WILLIAMS

CONCRETE FORM HARDWARE

PIONEERS OF BETTER FORMWORK

Form Clamp features originated and developed by Williams include:

- Positive disconnection of She-bolt from Inner Rod back from face of concrete.
- The use of High-tensile Inner Rods means greater working loads, lighter clamps, greater safety.
- Vibra-lock Clamps with flexible Bearing Bracket for angles up to 45°, and balanced Wing Nut for fast adjustment.
- Crimped Inner Rods and Anchors prevent turning and breaking of bond during removal of outer units, and ensure water-tight walls.
- Hex-lock Clamp combines free-turning Nut and Bearing Bracket in single unit.

VIBRA-LOCK CLAMP

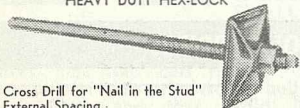
The Perfect Grip Clamp.

Cross Drill for "Nail in the Stud"
External Spacing.



Holes in Vibra-lock Bracket are convenient for nailing to forms if desired.

HEAVY DUTY HEX-LOCK

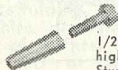


Cross Drill for "Nail in the Stud"
External Spacing.

High-tensile rods mean faster pouring, with elastic limit nearly four times that of mild steel.

HEX SOCKET SPACER CONE TIE (for Steel Forms)

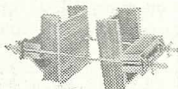
Spacer Cone for use with 3/8" dia. or 1/2" dia. high-tensile crimped rods.



1/2" x 1-1/2"
high-tensile
Stud Bolt.

SAFETY WALER SUPPORT ELIMINATES

1. Nailing walers together and toe nailing to stud.
2. Building scaffolding where men can work on walers.
3. Placing and replacing wooden cleats.
4. Cutting upper and lower walers to match and breaking joints at one place.
5. Danger of stepping on nails in removed cleats.
6. Expended material due to wrecking.



ADDITIONAL SPECIFICATIONS SUGGESTED BY WILLIAMS

Forms for Architectural Concrete should be adsorptive, such as wood forms. The clamps or ties used should be adjustable in length, and of such a type that no metal is left closer than 1 1/2" from the outside exposed surfaces and 1" from the inside exposed surfaces. These ties have a positive disconnection, leaving a portion of the metal projecting into the hole where the outer unit of the tie is removed to bond the concrete. Otherwise these patches are apt to be loosened, and spalling of the concrete in later years results; eventually moisture reaching the internal ties will rust, and rust streaks will appear on the surface of the concrete. The working load of the clamps or ties should be approximately 25% greater than pressure conditions designed for, so as to provide factors of safety for unusual conditions that often enter into pouring of concrete.

CRIMPED INNER RODS AND PIG-TAIL ANCHORS

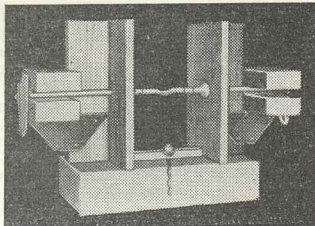
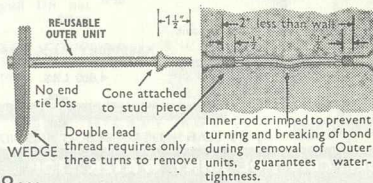
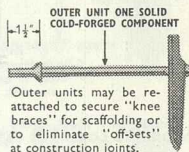


In 3/8", 1/2", 5/8" and 3/4" diameters, lengths 3" to 24" in 3" increments. Over 24" to 72" in 6" increments. Special lengths made to order.

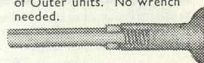
WEDGE-LOCK

WIRE TIE

- Latest Development in the Light Tie Field.
- Wedge and outer unit good for over 100 usages.
- Clamp has positive disconnection 1" back from concrete surface.
- For rigid alignment use Williams Form Aligners in your footings. Eliminates pouring of concrete nib.



Outer units may be re-attached to secure "knee braces" for scaffolding or to eliminate "off-sets" at construction joints.



NO...
Exposed Ties, Unbonded Patches, Water Seepage, Rust Streaks or Warped Surfaces.

BUT...
Accurately Spaced, Rigid Forms, Positive Tie Disconnection, No Spalling, Tie Bonded Patch (will stand hammer test), Better Finish, Perfect Alignment.

HIGH TENSILE INNER ROD



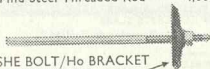
A CRIMPED WATERTIGHT TIE

Comparative Tensile Strengths

Williams 5/16" High Tensile Rods	6,000 lbs.
Ordinary 8 Gauge Tie Wire	1,125 lbs.
3/8" Mild Steel Threaded Rod	4,000 lbs.

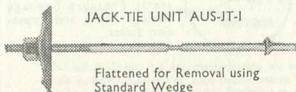
SHE BOLT/Ho BRACKET COMBINATION

Ho Hex Lock Bracket

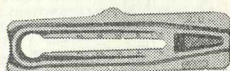


JACK-TIE UNIT AUS-JT-1

Flattened for Removal using Standard Wedge



HEAVY DUTY MALLEABLE WEDGE

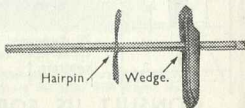


WEDGE LOCK ADAPTOR (For Steel Forms)



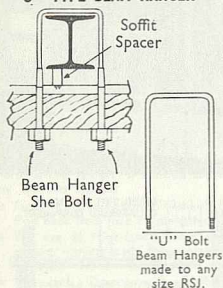
Special steel form adaptor for use with 5/16" dia. Wedge Lock Inner Rods.

SHE BOLT/WEDGE COMBINATION



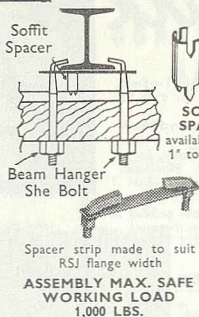
BEAM HANGERS

"U" TYPE BEAM HANGER

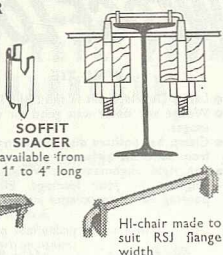


ASSEMBLY MAX. SAFE WORKING LOAD 3,500 LBS.

BOTTOM FLANGE BEAM HANGER



HI — CHAIR BEAM HANGER

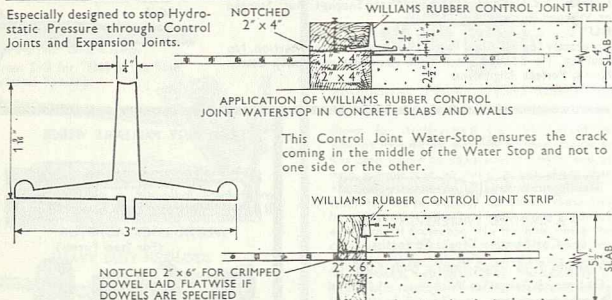
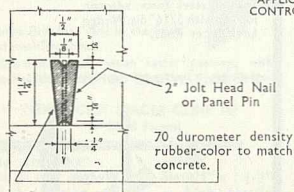
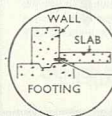


ASSEMBLY MAX. SAFE WORKING LOAD 4,000 LBS.

$\frac{3}{8}$ " x 8" BEAM HANGER SHE BOLT AND NUT

WILLIAMS RUBBER CONTROL JOINT WATER STOP

Especially designed to stop Hydrostatic Pressure through Control Joints and Expansion Joints.



Williams Rubber Control Joint Water Stop is especially designed to stop Hydrostatic Pressure Seepage through Joints and Expansion Joints.

CONSULT US FOR LAYOUTS AND ESTIMATES

ROCK ANCHORS AND CONSTRUCTION ACCESSORIES



ROCK ANCHOR ROD—High Tensile:
Dias. 5/16", 3/8", 1/2", 5/8", 3/4". Lengths
up to 15 ft. Max. thread length 6".



**ROCK ANCHOR ALLOY
SHELL AND CONE** tapped 5/16",
3/8", 1/2", 5/8", 3/4". Develops full
strength of Williams' high tensile
rods when driven in hard rock. For
hole dias. 1-1/4", 1-3/8" and 1-5/8".



DUPLEX NAIL for temporary nailing
of formwork. Sizes: 2" x 11 Ga.; 2-1/2" x 10
Ga.; 3" x 9 Ga.; 3-1/2" x 8 Ga.; 4" x 6 Ga.

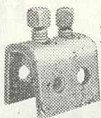
REINFORCEMENT SUPPORTS



WIRE BAR CHAIRS

Support heights
from 3/4" to 12".

ROD COUPLING for 5/16",
3/8", 1/2", 5/8", 3/4" dia.
rods.



**HICKEY ROD
SPLICER** for 3/8",
1/2", 5/8" dia. rods.

FORM ALIGN BAR:
Ensures accurate spac-
ing at foot of wall
forms. For wall widths
3" to 12".



PLASMIL PLASTIC CHAIRS
From 3/4" to 2".



**SOFFIT
SPACER** For
accurately
spacing forms
around beams
and columns.
Lengths —
1" to 9" in 1/4"
rises



THE MILLS HELICAL ANCHOR BOLT

The **Mills Helical Anchor Bolt** is used widely for temporary anchorage of steel tunnel travelling forms where the concrete is poured first in the invert, or in the form of kerbs and sufficient time elapses to allow concrete strengths to age satisfactorily. This Anchor does not replace the use of the Pigtail Anchor in cantilever or tiedown work in green concrete.

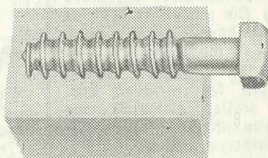


"Mills" Anchor Bolt



"Mills" Screw Anchor

For 3/4" and 1-1/4" Bolts



For all Williams tie recommendations we offer a comprehensive free service in planning and quantity figuring of your requirements. Please forward the plans with project layout to the address of your nearest Branch.



UNISTRUT

All purpose metal framing

Unistrut is designed as a single all-purpose structural framing system suitable for a wide variety of uses.

The Unistrut Nut and Unistrut fittings have been designed with the idea of standardizing the connections between the various parts of the skeleton and providing the means of easily attaching objects to it.

UNISTRUT RACKING

Unistrut is ideal for pallet and general storage racks, bar stock racks, cable and coil racks, and mezzanine floors, with the added advantage of being able to dismantle and re-erect on new sites.

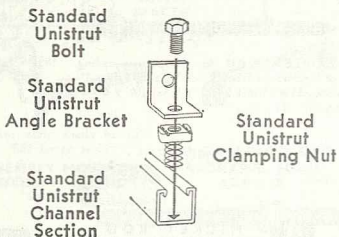
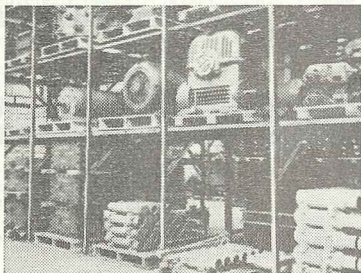
CONCRETE INSERTS

The Unistrut Concrete Insert is a new concept in concrete fixing with all of the advantages of the Unistrut system. The continuous slot permits making attachments anywhere along the entire length of the channel.

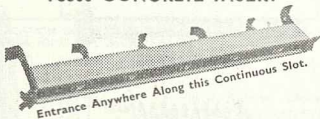
Unistrut Concrete Inserts are an ideal fixing medium for modern curtain walls, allowing for adjustment in three dimensions.

In average good concrete the recommended loading per foot run is 1,500 lb. with a safety factor of three.

BASIC COMPONENTS



P3300 CONCRETE INSERT



Two types of End Caps.

Type "A" End Cap, P-3380 illustrated, is used where anchoring on ends is not necessary. Type "B" Anchor End Cap, P-3703, has anchor pierced and flange slotted for nailing to form and for quick centring of inserts.



UNISTRUT CHANNEL SECTIONS—ENGINEERING DATA

BEAM LOADS.—Allowable uniformly distributed loads are listed for various simple spans—that is, beam on two supports. If load is concentrated at centre of span, multiply load from table by 0.5 and deflection by 0.8. The open face of the channel section is facing downwards.

COLUMN LOADS.—Column loadings are allowable axial loads for the unsupported heights listed. If loads are eccentric, loads should be reduced according to standard practice.

BEAM AND COLUMN DATA

Beam Span or Column unsupported height	Section No.	Uniform Load at 22,000 P.S.I. Stress	Deflection at 22,200 P.S.I. Stress	Maximum loading of Column	Beam Span or Column unsupported height	Section No.	Uniform Load at 22,000 P.S.I. Stress	Deflection at 22,200 P.S.I. Stress	Maximum loading of Column
18"	P1000	2,250	.03	10,250	60"	P1000	675	.34	6,000
	P2000	1,350	.03	5,750		P2000	405	.37	3,000
	P3300	785	.05	6,050		P3300	230	.55	1,370
	P4000	550	.06	4,900		P4000	160	.69	2,100
24"	P1000	1,700	.06	10,000	72"	P1000	570	.50	5,200
	P2000	1,000	.06	5,500		P2000	340	.54	2,400
	P3300	580	.09	5,050		P3300	190	.79	975
	P4000	415	.11	4,600		P4000	135	1.00	—
30"	P1000	1,350	.09	9,300	84"	P1000	485	.68	4,500
	P2000	810	.09	5,100		P2000	285	.71	2,000
	P3300	465	.14	4,100		P3300	170	1.07	750
	P4000	335	.18	4,000		P4000	—	—	—
36"	P1000	1,150	.13	9,000	96"	P1000	425	.89	4,000
	P2000	675	.13	4,800		P2000	250	.93	1,500
	P3300	390	.20	3,250		P3300	145	1.42	—
	P4000	280	.26	3,400		P4000	—	—	—
42"	P1000	970	.17	8,000	120"	P1000	335	1.35	3,000
	P2000	585	.18	4,100		P2000	200	1.43	800
	P3300	330	.27	2,550		P3300	—	—	—
	P4000	235	.35	3,000		P4000	—	—	—
48"	P1000	855	.22	7,000		—	—	—	—
	P2000	510	.24	3,700		—	—	—	—
	P3300	300	.36	2,050		—	—	—	—
	P4000	215	.47	2,800		—	—	—	—

Strength of P1010 and P4010 nuts used in P1000 and P3300 channels:

Resistance to slip 1,200 lbs. per bolt

Pull-out strength 2,000 lbs. per bolt

Strength of P1010 and P4010 nuts used in P2000 and P4000 channels:

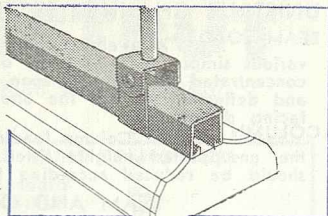
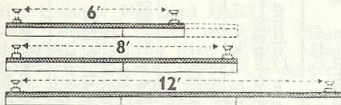
Resistance to slip 1,000 lbs. per bolt

Pull-out strength 1,000 lbs. per bolt

All figures shown at a safety factor of 3.

UNISTRUT ELECTRICAL TRUNKING

Strong, rigid Unistrut Channel allows longer spans and fewer hangers than any other system. It is easily erected, rust-proof, and any type of fluorescent fixture may be attached.



Use P4000 Unistrut—deflection $\frac{1}{8}$ "

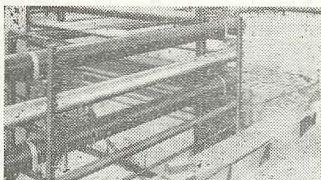
Use P2000 Unistrut—deflection $\frac{1}{8}$ "

Use P1000 Unistrut—deflection $\frac{1}{4}$ "

NOTE.—Fixtures intermittently spaced 2' 0" apart deflection approximately 65% of above table. Fixtures intermittently spaced 4' 0" apart deflection approximately 55% of above table.

UNISTRUT PIPE AND CABLE SUPPORTS

Racked with standard Unistrut channel and concrete inserts, service installations can be easily and quickly erected without drilling, grouting or welding, allowing for new services to be added at any time.



WIDE SELECTION OF CHANNELS

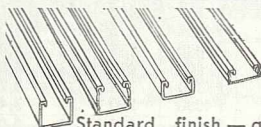
P1000, P2000, P3000 and P4000. Standard lengths: 10' and 20'.

P1000—1" x 1 1/2" x 12 gauge

P2000—1" x 1 1/2" x 16 gauge

P3300—1" x 1 1/2" x 12 gauge

P4000—1" x 1 3/16" x 16 gauge



Standard finish — grey enamel — hot dipped galvanized.

UNISTRUT NUTS AND BOLTS

Only Unistrut has these spring-held Clamping Nuts, which tie together both sides of the channel to form a box section at points of connection for greater load strength. Standard finish—electro-zinc plated.



A.—P1010 Standard Nut for P1000 and P2000 channels.
B.—P4010 Standard Nut for P3300 and P4000 channels.
C.—Standard Bolt $\frac{1}{2}$ " x $15/16$ ".

AGENCY DIVISION

Australian Representatives for the following Companies
and their products:—

G.K.N. (S.W.) LTD.—Rounds: $7/32''$ to $2''$ diameter. Reinforcing Bars: $7/32''$ to $2''$ diameter. High-tensile Deformed Bars also available. Squares: $\frac{1}{2}''$ to $1''$. Flats: $1'' \times \frac{1}{4}''$ to $\frac{1}{2}''$, $1\frac{1}{4}'' \times 3/16''$ to $\frac{1}{2}''$, $1\frac{1}{2}'' \times 3/16''$, $2'' \times 3/16''$, $1\frac{1}{2}''$ to $2'' \times \frac{1}{2}''$ to $\frac{3}{4}''$, $2''$ to $4'' \times \frac{1}{4}''$ to $1''$. Angles: All popular sizes $1'' \times 1'' \times \frac{1}{8}''$ to $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{2}''$ and intermediate sizes. Channels: $3'' \times 1\frac{1}{2}'' \times 4.60$ and 5.27 pounds per foot. Silico-Manganese Flats and Special Sections by arrangement. H.R.M.S. Strip: $2\frac{1}{2}''$ to $8\frac{1}{2}''$ wide and 6 S.W.G. to 16 S.W.G. C.R.M.S. Strip: $\frac{1}{4}''$ to $20''$ wide $\times .008''$ to $.128''$ thick. Electro-galvanized C.R.M.S. Strip: $6''$ to $18'' \times .008''$ to $.036''$ thick. All in the usual tempers and finishes. Tube, Strapping and Cable Tape Strips. M.S. Bright Drawn Wires: Round, square, oval, flat and half-round sections— $1''$ diameter to 23 S.W.G. and equivalent sizes. Coppered M.S. Wires and Wire Rods in coil. Wire Nails.

G.K.N. (MIDLANDS) LTD.—Lester Anti-vibration Nuts and Special High-tensile Bolts.

EXORS. OF JAMES MILLS LTD.—"Ledloy" Free-cutting Steel Bars. Bright Drawn M.S. and Carbon Bars—Rounds, Hexagons, Squares and Flats, etc. "Hurcol" Railway Track Lubricators. "Mills" Railway Track Fastenings.

BAYLISS JONES & BAYLISS LTD.—"B.J.B." Railway Track Fastenings. Special Sections in H.R.M.S.

SOMERSET WIRE CO. LTD.—High-tensile Patented Spring Steel Wires. High-tensile Plain and Crimped Concrete Pre-stressing Wires. "Bridge Brand" High-tensile Steel Concrete Pre-stressing Strands.

JOHN LYSAGHT'S BRISTOL WORKS LTD.—Galvanized hexagonal Wire Netting.

THE B.R.D. CO. LTD.—The "Chobham" Constant Velocity Universal Joint. Gas Turbine and Compressor Blades and general engineering precision products. The "Bermuda" Inboard and Outboard Marine Engines.

THE TENTOR BAR CO. LTD.—"Tentor" and other special concrete reinforcing bars.

USKSID ENGINEERING CO. LTD.—Electric Winders, Capstans and Haulage Gear. Ram Pumps. Equipment for the Mining and Engineering Industries.

BRYMBO STEEL WORKS LTD.—Electrically melted special and carbon steels in slabs, bars and sheet bars.

SANKEY SHELTON LTD.—Steel furniture.

NETTLEFOLDS PTY. LTD. SUNSHINE VICTORIA

THE GUARANTEE

OF QUALITY



NETTLEFOLDS-PARKER-KALON (N.P.K.) CASE-HARDENED SELF-TAPPING SCREWS

Case-hardened Self-tapping Screws are used for joining and making fastenings to metal sheets and other metal parts. These screws eliminate the need for tapping holes. They tap their own threads as they are driven in.

THREAD TYPES

HEAD TYPES



Z

For joining and making fastenings to metal sheets from 28 gauge (.016) up to 6 gauge (.198).



A

For assembling light metal sheets up to 18 gauge (.050).



U

Hardened metallic drive screw for making permanent fastenings to iron, brass and aluminium castings, steel, plastics, etc.

C'sunk Head



Raised Head



Round Head



Mush. Head



Hex. Head



Binding Head



Phillips Recessed Head



NOTE.—For drill hole sizes, see page 129.

HOLE SIZES

FOR NETTLEFOLDS-P.K.
SELF-TAPPING SCREWS

TYPE "Z" N.P.K. SCREWS

Dia. of Screw	Steel Sheet Gauge	Dia. of Hole	Drill Size
No. 2 .088"	28-26	.063	No. 52
	24	.067	51
	22	.070	50
	20-18	.073	49
	16	.076	48
No. 4 .114"	28-26	.086	44
	24	.089	43
	22-20	.093	42
	18	.096	41
	16	.099	39
No. 6 .139"	14	.101	38
	28-26	.104	37
	24-22	.106	36
	20	.110	35
	18	.111	34
No. 7 .154"	16	.116	32
	14	.120	31
	12	.128	30
	26-20	.116	32
	18	.120	31
No. 8 .166"	16	.128	30
	14	.136	29
	12	.140	28
	10-1/8	.149	25
	10-1/8	.152	24
No. 10 .189"	26-18	.144	27
	16	.152	24
	14	.157	22
	12	.161	20
	10-1/8	.169	18
No. 12 .215"	8	.173	17
	24-22-20	.166	19
	18	.169	18
	16	.177	16
	14	.182	14
No. 14 .246"	12	.185	13
	10-1/8	.196	9
	8	.201	7
	14	.204	6
	12	.209	4
	10-1/8	.228	1
	8-6-3/16	.234	15/64

TYPE "A" N.P.K. SCREWS

Dia. of Screw	Steel Sheet Gauge	Dia. of Hole	Drill Size
No. 4 .114"	28-26	.086	No. 44
	24-22	.093	42
	20	.098	40
No. 6 .141"	28-26-24	.099	39
	22	.101	38
	20	.106	36
No. 7 .158"	28-26	.104	37
	24	.110	35
	22	.113	33
	20	.116	32
	18	.120	31
No. 8 .168"	26-24	.113	33
	22	.116	32
	20	.120	31
	18	.128	30
No. 10 .194"	26-24-22	.128	30
	20	.136	29
	18	.149	25
No. 12 .221"	24	.147	26
	22	.149	25
	20	.152	24
	18	.157	22
No. 14 .254"	24	.180	15
	22	.189	12
	20	.191	11
	18	.196	9

TYPE "U" N.P.K. SCREWS

Dia. of Screw		Dia. of Hole	Drill Size
No. 00	.060"	.052	No. 55
0	.075"	.067	51
2	.100"	.086	44
4	.116"	.104	37
6	.140"	.120	31
7	.154"	.136	29
8	.167"	.144	27
10	.182"	.161	20
12	.212"	.191	11
14	.242"	.221	2

NOTE.—The recommended hole sizes for all types may be varied slightly if necessary. For hard material, use larger drill. For soft material, use smaller drill.

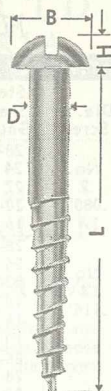
Galv. Cone-head Roofing Screws

ASSURE
PERMANENT
ROOF FIXINGS

Dia. of Head "B" = twice diameter of Shank "D".
Depth of Head "H" = .7 of the dia. of Shank "D".

APPROXIMATE NUMBER PER CWT.

Length	Screw Gauge					
	10 (.192)		12 (.220)		14 (.248)	
"L"	Gross	Doz.	Gross	Doz.	Gross	Doz.
1½	62	11	48	11	—	—
1¾	—	—	43	1	31	2
2	—	—	39	5	29	2
2¼	—	—	34	—	27	—
2½	—	—	30	9	24	4
3	—	—	—	—	20	3
3½	—	—	—	—	17	—
4	—	—	—	—	15	6



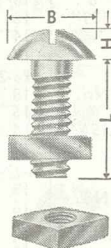
Galvanized Mushroom-head Bolts and Nuts

HEAD DIMENSIONS:

Dia. of Head "B" = 2.25 dia. of Shank "D".
Depth of Head "H" = ¾ of dia. of Shank "D".

NUT DIMENSIONS:

Whit. Thread	3/16"	7/32"	1/4"	9/32"	5/16"
Across Flats	3/8"	7/16"	1/2"	1/2"	9/16"
Thickness	.112"	.131"	.150"	.150"	.169"



Galv. Tank Rivets and Washers

RIVETS:

Packed in ½ cwt. bags.

Number of gross per cwt.:

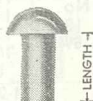
Sizes 5/16" x 3/16" = 157 gross 9 doz. per cwt.

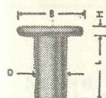
Sizes: 3/8" x 3/16" = 141 gross 9 doz. per cwt.

WASHER DIMENSIONS:

(Weights shown are approx. weights per gross)

"D"	"H"	Gauge	Weight
11/16"	3/16"	16	.95 lb.
13/16"	1/4"	16	1.35 "
3/4"	9/32"	16	1.08 "
13/16"	5/16"	16	1.22 "





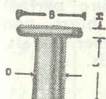
MILD STEEL COOPERS' RIVETS

Available in sizes Nos. 4 to 28.

In $\frac{1}{2}$ cwt. bags.

DIMENSIONS AND WEIGHTS

No.	"D"	"B"	"H"	"L"	Weight per approx. 1,000
4	.192	.384	.050	.290	4 lb.
6	.220	.440	.060	.320	6 "
8	.248	.496	.065	.385	8 "
10	.262	.524	.075	.405	10 "
12	.276	.552	.075	.455	12 "
14	.290	.580	.080	.470	14 "
16	.304	.608	.080	.500	16 "
18	.318	.636	.080	.520	18 "
20	.332	.664	.080	.550	20 "
22	.332	.664	.085	.575	22 "
24	.346	.692	.090	.570	24 "
26	.346	.692	.090	.635	26 "
28	.360	.720	.100	.640	28 "



MILD STEEL TINMEN'S RIVETS

Tinned or Black.

Available in sizes Nos. 4 to 20, in $\frac{1}{2}$ cwt. bags.

DIMENSIONS AND WEIGHTS

No.	"D"	"B"	"H"	"L"	Weight per approx. 1,000
4	.094	.188	.023	.180	10 oz.
6	.108	.216	.027	.199	14 "
8	.122	.244	.030	.230	1 $\frac{1}{4}$ lb.
9	.136	.272	.034	.246	1 $\frac{1}{2}$ "
10	.150	.300	.037	.271	2 "
11	.150	.300	.037	.297	2 $\frac{1}{2}$ "
12	.164	.328	.041	.319	3 "
13	.187	.374	.047	.338	4 "
14	.206	.412	.051	.359	5 "
16	.218	.436	.055	.445	7 "
18	.250	.500	.062	.502	10 "
20	.276	.552	.069	.563	14 "

REAPER RIVETS

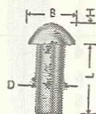
ROUND AND COUNTERSUNK HEAD

HEAD DIMENSIONS:

Round Head.—Diameter of Head "B" = 1.5 of diameter of Shank "D". Depth of Head "H" = .55 of diameter of Shank "D". "L" = Length.

APPROXIMATE NUMBER OF RIVETS PER POUND

Length	$\frac{3}{8}"$	$\frac{1}{2}"$	$\frac{5}{8}"$	$\frac{3}{4}"$	$\frac{7}{8}"$	1"	$1\frac{1}{4}"$
No. 5 (.212")	171	154	137	120	103	86	52
No. 6 (.192")	186	169	152	135	118	101	67



Countersunk Head.—Diameter of Head "B" = 1.6 diameter of Shank "D". Depth of Head = .3 of diameter of Shank "D". Countersunk 90°. "L" = Length.

APPROXIMATE NUMBER OF RIVETS PER POUND

Length	$\frac{3}{8}"$	$\frac{1}{2}"$	$\frac{5}{8}"$	$\frac{3}{4}"$	$\frac{7}{8}"$	1"	$1\frac{1}{4}"$
No. 5 (.212")	201	184	167	150	133	116	82
No. 6 (.192")	216	199	182	164	148	131	97

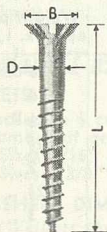


WOOD SCREWS

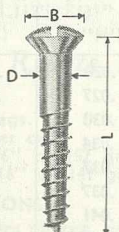
Nettlefold's Wood Screws are machine-turned to ensure perfect heads, concentricity of head with shank, freedom from burrs, and good appearance. Available in mild steel, brass, and other metals, and with Countersunk, Round, Raised or Special Heads.

HEAD TYPES AND DIMENSIONS

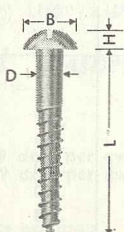
Countersunk Head



Raised Head



Round Head



Phillips Recessed Head



"B" = twice dia. of Shank "D". Included angle C'sink "A", 90°

"B" = twice dia. of Shank "D". Included angle C'sink "A", 90°

"B" = twice dia. of Shank "D". "H" = $\frac{3}{4}$ of dia. "D".

Raised, Round or Countersunk.

NOTE.—For decimal equivalents of screw gauges, see page 134.

MACHINE SCREWS

Stocked in steel and brass in Whitworth Threads (B.S. 450/1958) and B.A. Threads (B.S. 57/1951) in Countersunk, Round and Cheese Heads.

Heads and threads, or materials other than the above, can be supplied on demand.

DECIMAL EQUIVALENTS AND THREADS PER INCH

B.S.W. AND B.S.F. THREADS

UNIFIED THREADS

Dia.	Decimal Equiv.	Threads per in.		Dia.	Dec. Equiv.	Threads per in.	
		B.S.W.	B.S.F.			U.N.C.	U.N.F.
1/8"	.1250"	40	—	No. 2	.086"	56	64
5/32"	.1563"	32	—	" 4	.112"	40	48
3/16"	.1875"	24	32	" 6	.125"	32	40
1/4"	.2500"	20	26	" 8	.164"	32	36
5/16"	.3125"	18	22	" 10	.190"	24	32
3/8"	.3750"	16	20	" 12	.216"	24	28
7/16"	.4375"	14	18	1/4"	.250"	20	28
1/2"	.5000"	12	16	5/16"	.3125"	18	24
5/8"	.6250"	11	14	3/8"	.375"	16	24
3/4"	.7500"	10	12	7/16"	.4375"	14	20
				1/2"	.500"	13	20
				5/8"	.625"	11	18
				3/4"	.750"	10	16

B.A. THREAD

Dia.	Dec. Equiv.	T.P.I.	Dia.	Dec. Equiv.	T.P.I.
6 B.A.	.110	47.9	2 B.A.	.185	31.4
5 B.A.	.126	43.1	1 B.A.	.209	28.2
4 B.A.	.142	38.5	0 B.A.	.236	25.4
3 B.A.	.161	34.8			

DECIMAL EQUIVALENTS

WOOD SCREW GAUGE, IMPERIAL STANDARD WIRE GAUGE,
AND FRACTIONS OF AN INCH

Screw Gauge (S.G.)	Imp.St. Wire Gauge	Fraction of an Inch	Equiv. in Decimal of Inch	Screw Gauge (S.G.)	Imp.St. Wire Gauge	Fraction of an Inch	Equiv. in Decimal of Inch
	30		.0124			3/16	.1875
	29		.0136	10	6		.192
	28		.0148			13/64	.203125
		1/64	.015625	11			.206
	27		.0164		5		.212
	26		.018			7/32	.21875
	25		.020	12			.220
	24		.022		4		.232
	23		.024	13			.234
	22		.028			15/64	.234375
		1/32	.03125	14			.248
	21		.032			1/4	.250
	20		.036		3		.252
	19		.040	15			.262
		3/64	.046875	16	2		.276
	18		.048			9/32	.28125
4/0			.054	17			.290
	17		.056		1		.300
3/0			.057	18			.304
2/0			.060			5/16	.3125
		1/16	.0625		0		.324
0			.063	20			.332
	16		.064			11/32	.34375
1			.066		2/0		.348
	15		.072	22			.360
		5/64	.078125		3/0		.372
2	14		.080			3/8	.375
	13		.092	24			.388
		3/32	.09375		4/0		.400
3			.094			13/32	.40625
	12		.104	26			.416
4			.108		5/0		.432
		7/64	.109375			7/16	.4375
	11		.116	28			.444
5			.122		6/0		.464
		1/8	.125			15/32	.46875
	10		.128	30			.472
6			.136	32	7/0	1/2	.500
		9/64	.140625	36			.556
	9		.144			9/16	.5625
7			.150	40			.612
		5/32	.15625			5/8	.625
	8		.160			11/16	.6875
8			.164			3/4	.750
		11/64	.171875			13/16	.8125
	7		.176			7/8	.875
9			.178			15/16	.9375

BOLTS AND NUTS

Nettlefolds Pty. Ltd. can now supply a comprehensive range of Bolts and Nuts, as follows:—

Black Cup Square (B.R.H.).— $3/16$ " dia. to $3/4$ " dia. in all lengths.

Black Hex. Round Hex. (Engine).— $1/4$ " dia. to 1" dia. in all lengths.

Black Hexagon Set Screws.— $1/4$ " dia. to 1" dia. in all lengths.

Black Hexagon Coach Screws.— $1/4$ " to 1" dia. in all lengths.

High Tensile Hex. Bolts and Nuts and High Tensile Hex. Set Screws.— $1/4$ " to $1/2$ " dia. in all lengths.

Gold-headed and hot forged "specials" can be produced against firm orders.

NETTLEFOLDS PTY. LTD.

HAVE IN STOCK A SCREW, BOLT OR NUT
FOR EVERY PURPOSE

IF YOU HAVE A FASTENING PROBLEM,
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NETTLEFOLDS PTY. LTD.

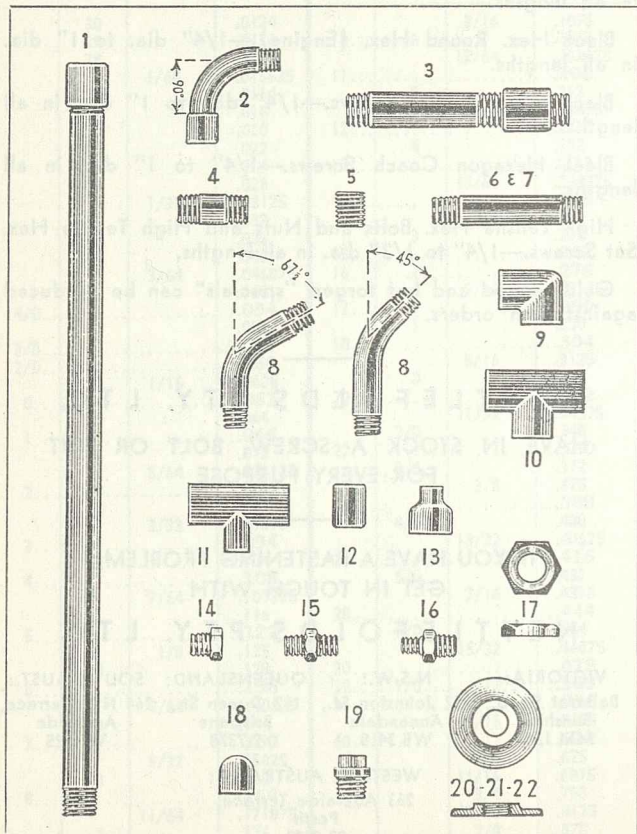
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STEWARTS AND LLOYDS (DISTRIBUTORS) PTY. LTD.

(INCORPORATED IN VICTORIA)

*S. & L. SCREWED AND SOCKETED
STEEL TUBES AND FITTINGS*



PIPE CHARACTERISTICS

Plain End and Screwed and Socketed Steel Tubes

Nom. Outside Bore ins.	Outside Dia. ins.	Quality	Thickness		Ft. per ton		Nom. Bore ins.	Outside Dia. ins.	Quality	Thickness		Ft. per ton	
			SWG	In.	P/E	S & S				SWG	In.	P/E	S & S
$\frac{1}{8}$ "	13/32"	Medium Heavy	14	0.080	8205	8146	1½"	1-29/32"	Medium Med. Gal.	10	0.128	923	911
$\frac{1}{4}$ "	17/32"	Medium Med. Gal. Heavy	12	0.104	6829	6787	2"	2-3/8"	Heavy Ammonia	10	0.128	895	885
$\frac{3}{8}$ "	11/16"	Medium Med. Gal. Heavy Ammonia	13	0.092	5150	5114	2½"	3"	Medium Med. Gal. Heavy Ammonia	8	0.160	752	744
$\frac{1}{2}$ "	27/32"	Medium Med. Gal. Heavy Ammonia	13	0.092	4859	4828	3"	3-1/2"	Medium Med. Gal. Heavy Ammonia	5	0.212	585	—
$\frac{3}{4}$ "	1-1/16"	Medium Med. Gal. Heavy Ammonia	11	0.116	4316	4291	3½"	4"	Medium Med. Gal. Heavy Ammonia	9	0.144	653	644
1"	1-1/32"	Medium Med. Gal. Heavy Ammonia	11	0.116	4316	—	4"	4-1/2"	Medium Med. Gal. Heavy Ammonia	9	0.144	636	627
1¼"	1-1/16"	Medium Med. Gal. Heavy Ammonia	13	0.092	3923	3895	5"	5-1/2"	Medium Med. Gal. Heavy Ammonia	7	0.176	542	536
		Medium Med. Gal. Heavy Ammonia	13	0.092	3709	3685	6"	6-1/2"	Medium Med. Gal. Heavy Ammonia	5	0.212	458	—
		Medium Med. Gal. Heavy Ammonia	11	0.116	3246	3228			Medium Med. Gal. Heavy Ammonia	9	0.144	511	503
		Medium Med. Gal. Heavy Ammonia	10	0.128	3006	—			Medium Med. Gal. Heavy Ammonia	9	0.144	498	490
		Medium Med. Gal. Heavy Ammonia	12	0.104	2725	2705			Medium Med. Gal. Heavy Ammonia	7	0.176	423	418
		Medium Med. Gal. Heavy Ammonia	12	0.104	2613	2595			Medium Med. Gal. Heavy Ammonia	4	0.232	328	—
		Medium Med. Gal. Heavy Ammonia	10	0.128	2288	2274			Medium Med. Gal. Heavy Ammonia	8	0.160	393	385
		Medium Med. Gal. Heavy Ammonia	9	0.144	2082	—			Medium Med. Gal. Heavy Ammonia	8	0.160	384	376
		Medium Med. Gal. Heavy Ammonia	12	0.104	2109	2094			Medium Med. Gal. Heavy Ammonia	6	0.192	331	325
		Medium Med. Gal. Heavy Ammonia	12	0.104	2024	2009			Medium Med. Gal. Heavy Ammonia	4	0.232	277	—
		Medium Med. Gal. Heavy Ammonia	10	0.128	1758	1747			Medium Med. Gal. Heavy Ammonia	8	0.160	341	335
		Medium Med. Gal. Heavy Ammonia	8	0.160	1456	—			Medium Med. Gal. Heavy Ammonia	8	0.160	330	324
		Medium Med. Gal. Heavy Ammonia	10	0.128	1363	1354			Medium Med. Gal. Heavy Ammonia	6	0.192	287	282
		Medium Med. Gal. Heavy Ammonia	10	0.128	1317	1309			Medium Med. Gal. Heavy Ammonia	7	0.176	276	270
		Medium Med. Gal. Heavy Ammonia	8	0.160	1120	1114			Medium Med. Gal. Heavy Ammonia	7	0.176	267	261
		Medium Med. Gal. Heavy Ammonia	7	0.176	1032	—			Medium Med. Gal. Heavy Ammonia	5	0.212	231	226
		Medium Med. Gal. Heavy Ammonia	10	0.128	1062	1054			Medium Med. Gal. Heavy Ammonia	6	0.192	205	200
		Medium Med. Gal. Heavy Ammonia	10	0.128	1030	1023			Medium Med. Gal. Heavy Ammonia	6	0.192	200	195
		Medium Med. Gal. Heavy Ammonia	8	0.160	867	862			Medium Med. Gal. Heavy Ammonia	5	0.212	187	183
		Medium Med. Gal. Heavy Ammonia	6	0.192	738	—			Medium Med. Gal. Heavy Ammonia	6	0.192	173	168
		Medium Med. Gal. Heavy Ammonia							Medium Med. Gal. Heavy Ammonia	6	0.192	168	164
		Medium Med. Gal. Heavy Ammonia							Medium Med. Gal. Heavy Ammonia	5	0.212	157	153

Weights per foot of screwed and socketed tubing are based on the overall length of tube plus socket, screwed to basic engagement.

STEEL TUBES AND FITTINGS

RANGE OF GALVANIZED AND
UNGALVANIZED TYPES MANUFACTURED

	6"	5"	4"	3½"	3"	2½"	2"	1½"	1¼"	1"	¾"	½"	⅜"	¼"	⅛"
TUBES															
1. Tubes (2' long and over)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TUBULARS															
2. Bends (90°)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4. Barrel Nipples	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3. Longscrews	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5. Plain Nipples	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6. Pieces not socketed (4"-11")	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7. Pieces not socketed (12"-23½")	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8. Springs not socketed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
OTHER FITTINGS															
9. Elbows	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9a. Elbows, Reducing ..	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10. Tees	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11. Tees, Reducing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12. Sockets	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13. Sockets, Reducing ..	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14. Bushes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15. Hexagon Nipples ..	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16. Hex. Nipples, Red.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17. Backnuts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18. Caps	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19. Plugs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20. Flanges, Table "D"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21. Flanges, Table "E"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22. Flanges, Table "H"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

A.I.S. SPUN CAST IRON PIPE

SPIGOT AND SOCKET — 12-FEET LENGTHS

Dia-meter	Wall Thickness	Weight of 12' length	Dia-meter	Wall Thickness	Weight of 12' length
4" (Gas)	.250	148 lb.	12"	.406	575 lb.
	.312	178 "		.531	729 "
	.344	193 "		.375	640 "
	.390	216 "		.469	780 "
6"	.281	249 "	15"	.594	963 "
	.344	296 "		.437	920 "
	.437	365 "		.531	1095 "
8"	.312	367 "	18"	.656	1323 "
	.375	431 "		.468	1194 "
	.500	554 "		.552	1379 "
9"	.344	447 "	20"	.677	1660 "
	.406	516 "		.500	1420 "
10"	.531	653 "		.593	1646 "
	.344	487 "		.718	1965 "

The above can be cement lined by A.I.S. if required.

COMPOSITION PIPE

LEAD-PIPE

Size Inside Dia.	Approx. Weight per yd.	Approx. length of Coils	Inside Dia.	Wt. per Yard	Length of Coils	Thickness of Wall
1 1/2"	1 lb.	165 feet	1 1/2"	3 lb.	45'	3/32"
5/16"	1 lb.	96 "	1 1/2"	7 "	45'	1/4"
1 1/4"	1 lb. 5oz.	70 "	1 1/2"	9 "	45'	5/16"
1 1/2"	1 lb. 7oz.	70 "	3/4"	5 "	45'	7/64"
1 3/4"	2 lb. 1oz.	45 "	3/4"	9 "	45'	3/16"
1 7/8"	2 lb. 13oz.	45 "	3/4"	11 "	45'	1/4"
1"	3 lb. 11oz.	55 "	1"	6 "	45'	1/8"
			1"	9 "	45'	3/16"
			1 1/4"	8 "	45'	1/8"
			1 1/4"	12 "	45'	3/16"
			1 1/2"	17 "	45'	1/4"
			1 1/2"	16 "	45'	1/4"
			2"	16 "	45'	3/16"
			2"	20 "	45'	5/32"
			2"	28 "	45'	1/4"

LEAD SOIL PIPE

Inside Dia.	Lengths	Approx. Wt. per length
1 1/4"	10'	18 lb.
1 1/2"	10'	21 "
2"	10'	30 "
2 1/2"	12'	39 "
3"	10'	58 "
3 1/2"	12'	69 "
4"	10'	78 "
4 1/2"	12'	90 "

And up to 6" dia. x 3/8" wall if required.

A.R.C. FABRIC

SPECIFICATIONS OF STANDARD MESHES

A.S.A84 Ref. No.	Distance centre to centre of wires		Gauge of wires		Sectional area per foot width (sq. in.)	Nominal weight per sq. yd. (lb.)
	Main (in.)	Cross (in.)	Main S.W.G.	Cross S.W.G.		
301	3	8	4/0	2	.5027	18.11
302	3	8	3/0	2	.4348	16.04
303	3	8	2/0	3	.3805	13.92
304	3	8	1/0	3	.3298	12.37
305	3	8	1	3	.2828	10.93
306	3	12	2	2	.2393	9.14
307	3	12	3	3	.1996	7.63
308	3	12	4	4	.1691	6.46
309	3	12	5	5	.1412	5.40
310	3	12	6	6	.1158	4.42
312	3	12	8	8	.0804	3.07
314	3	12	10	10	.0515	1.97
601	6	6	1	1	.1414*	8.65
602	6	6	2	2	.1197*	7.32
603	6	6	3	3	.0998*	6.10
604	6	6	4	4	.0845*	5.17
605	6	6	5	5	.0706*	4.32
606	6	6	6	6	.0579*	3.53
608	6	6	8	8	.0402*	2.46
610	6	6	10	10	.0257*	1.57
—	3	3	3	3	.1996*	12.20
—	3	3	5	5	.1412*	8.64

*In each direction.

A.R.C. FABRIC

STANDARD SHEETS
SIZES AND SHIPPING DIMENSIONS

A.S.A84 Ref. No.	Length of Stand- ard Sheet (lb.)	Width of Stand- ard Sheet	Con- tents of Stand- ard Sheet (sq. yds.)	Weight of Stand- ard Sheet (ft.)	Shipping Dimensions of 10 Sheets			
					Length (in.)	Width (in.)	Depth (in.)	Weight (lb.)
301	18	7' 0"	14	254	216	84	3 $\frac{3}{4}$	2535
302	18	7' 0"	14	225	216	84	3 $\frac{5}{8}$	2246
303	18	7' 0"	14	195	216	84	3 $\frac{1}{2}$	1949
304	18	7' 0"	14	173	216	84	3 $\frac{1}{4}$	1732
305	18	7' 0"	14	153	216	84	3	1530
306	18	7' 0"	14	128	216	84	3	1280
307	18	7' 0"	14	107	216	84	2 $\frac{3}{4}$	1068
308	18	7' 0"	14	90	216	84	2 $\frac{1}{2}$	904
309	18	7' 0"	14	76	216	84	2 $\frac{3}{8}$	756
310	18	7' 0"	14	62	216	84	2 $\frac{1}{4}$	619
312	Normally stocked in rolls only.							
314								
601	20	7' 6"	16 $\frac{2}{3}$	144	240	90	3 $\frac{3}{8}$	1440
602	20	7' 6"	16 $\frac{2}{3}$	122	240	90	3	1220
603	20	7' 6"	16 $\frac{2}{3}$	102	240	90	2 $\frac{3}{4}$	1020
604	20	7' 6"	16 $\frac{2}{3}$	86	240	90	2 $\frac{1}{2}$	860
605	20	7' 6"	16 $\frac{2}{3}$	72	240	90	2 $\frac{3}{8}$	720
606	20	7' 6"	16 $\frac{2}{3}$	59	240	90	2 $\frac{1}{4}$	590
608	20	7' 6"	16 $\frac{2}{3}$	41	240	90	1 $\frac{3}{4}$	410
610	Normally stocked in rolls only.							
—	10	7' 0"	7.78	95	120	84	2 $\frac{3}{4}$	950
—	10	7' 0"	7.78	67	120	84	2 $\frac{3}{8}$	670

AREAS OF A.R.C. FABRICS AND MILD STEEL BARS GIVING EQUAL STRENGTHS

A.R.C. Fabric—30,000 p.s.i.		M.S. Bars—20,000 p.s.i.
A.S. A84 Ref. No.	Area/ft. width sq. ins.	Area/ft. width sq. ins.
301	.5027	.7541
302	.4348	.6522
303	.3805	.5708
304	.3298	.4947
305	.2828	.4242
306	.2396	.3590
307	.1996	.2994
308	.1691	.2537
309	.1412	.2118
310	.1158	.1737
312	.0804	.1206
314	.0515	.0773
601	.1414	.2121
602	.1197	.1796
603	.0998	.1497
604	.0845	.1268
605	.0706	.1059
606	.0579	.0869
608	.0402	.0603
610	.0257	.0386

GENERAL INSTRUCTIONS FOR PAINTING

To obtain the best possible results from paint it is essential that the surface is clean and firm, and that the necessary primer or sealer is applied to ensure durability and adhesion and prevent excessive absorption. Check the instructions on the container of each type of paint.

Ensure all surfaces are free from dirt, grease, oil, rust, and moisture, so that a finish resistant to peeling, cracking, blistering or discolouration is obtained.

Stir all materials thoroughly before use, a good plan being to decant the vehicle off the surface of the pigment, work up the pigment mass, and add the decanted liquid slowly while stirring. Where practicable, place the container upside down for as long as possible before opening.

When painting masonry, cement render, plaster and similar surfaces, allow to age for at least one month to ensure moisture and alkali content is reduced to safe, workable condition. Cement sealers are designed to form an alkali-resistant barrier, and to prevent excessive absorption.

Softwood requires an oil-based undercoat reduced with raw linseed oil. Hardwood requires a similar undercoat thinned with turpentine only.

Iron and steel should be primed with a red-lead primer or other recommended metal primer.

Galvanized steel sheets can be treated in any of three ways:—

- Allow to age for at least six months before painting.
- Apply a coat of galvanized iron zinc dust primer.
- Pre-treat with a commercial preparation to produce a zinc phosphate coating. In each case apply finish without further undercoating.

Always allow ample drying time between successive coats.

Keep brushes and equipment clean. Always clean up immediately job is finished, removing paint spots from glass, etc.

COVERING CAPACITY OF FIRST QUALITY PAINTS (Average surface)

	Sq. ft. per gall. per coat
Exterior Gloss Paints	800-850
Flat Enamel and Oil Finishes	600
Cold Water Paints	1,000
Kalsomine	400 sq. ft. per 5lb. pkt.
Cement Sealer	500-600
Galvanized Iron Primer	900
Roof Paint	800
Aluminium Paint	900
Flat Oil Stain	800
Oil Varnish Stain	800
Varnishes	900

ZINC DUST-ZINC OXIDE PAINT.—For painting sheet laps and roofs.

Zinc Dust 12 lb. Raw Linseed Oil . 1 gallon

Zinc Oxide Paste . 12 " Liquid Driers .. ¾ pint

N.B.—Zinc Oxide Paste is 82% zinc oxide and 18% raw linseed oil.

HOW TO MAKE GOOD CONCRETE

PROPORTIONS.—Correct proportions of cement, aggregate, and water depend on nature of work for which concrete is intended, and character and condition of aggregate. Table of quantities for various classes of work is given below.

Class of Work	Proportions of nominal mix (volumes)	Materials required to make 10 cub. yds. of concrete			Yield of mixture per paper bag of cement (c. ft.)	Water in gals. per bag of cement
		Cement (bags)	Sand (c. yds.)	Metal or gravel (c. yds.)		
High structural strength concrete for thin reinforced walls, slender reinforced columns, fence posts, heavy-duty floors.	1:1½:3	76	4.2	8.5	3.55	4.7
Commonly adopted mixture for reinforced concrete beams and floor slabs, roads, footpaths, etc., silos, etc.	1:2:4	60	4.4	8.9	4.50	5.4
For strong foundations, lean-mix roads.	1:2½:5	49	4.5	9.1	5.50	6.1
Foundations for roads, machinery, buildings, etc., and for concrete in mass walls.	1:3:6	41	4.6	9.1	6.60	6.9
Watertight plaster coats for cellars, tanks, dairy walls, etc.	1:2	128	9.5	—	2.10	4.2
Surface rendering for two-course concrete paths.	1:2½	110	10.1	—	2.45	4.5
Mortar for wall plaster, rough-casting, and stucco.	1:3	96	10.6	—	2.80	4.9

Job proportioning may be by volume or weight; volumetric method is usual for small jobs. Water should be carefully measured, allowance being made for moisture content of sand.

CONCRETE (continued) MATERIALS

PORTLAND CEMENT.—Normal type suited to all normal work; High-Early Strength and Low-Heat for special applications only. Packing.—Paper bags hold 1 cu. ft. = 94 lb. nett.

Storage.—Must be dry; stack away from exterior walls, and in a manner to prevent air circulation through stack.

At time of use, cement should be free-flowing and free from lumps.

SAND OR FINE AGGREGATE.—Must be clean and free from earth, clay, humus, etc.; a coarse sand is best for concrete making, but particles should preferably be graded from coarse to fine. A sand containing silt and/or clay should be washed before use.

COARSE AGGREGATE.—May be gravel or crushed stone, graded from the largest particles down to the size of the largest sand grains to be used. Particles should be clean, hard, impervious and free from organic matter.

OTHER AGGREGATE.—(1) Crushed blast furnace slag may be an economic and satisfactory material. (2) Cinders and coke-breeze should be used only for unimportant work unless previous experience has shown material from the same source to be satisfactory. (3) Lightweight aggregate of the bloated clay or shale type is suitable for structural concretes with strengths up to 4000-5000 p.s.i. The concrete density varies from 90 to 105 p.c.f. (4) Exceptionally lightweight aggregate—vermiculite or perlite—can be used for concretes where no structural strength is required. It has excellent sound-absorbing and heat-resisting properties. It is suitable for use as a fire-proofing medium.

WATER.—Should be drinkable.

USES OF CONCRETE.—Information relating to concrete problems will be given upon request to the Cement and Concrete Association of Australia, 14 Spring Street, Sydney.

MIXING

Concrete should preferably be mixed in a concrete mixer, hand or power operated, or may be hand mixed.

Mixers, when used, should revolve at speeds recommended by makers, and a mixing time of $1\frac{1}{2}$ to 2 minutes after addition of all ingredients is recommended.

HAND MIXING is carried out as follows:—

Equipment.—Shovel, mixing board, watering can, measuring box.

Method.—(1) Sand measured and spread on mixing board.

(2) Cement spread over sand.

(3) Sand and cement turned over with shovels until thoroughly mixed and uniform colour throughout.

(4) Coarse aggregate measured, spread on top, and mixing process repeated until colour again uniform.

(5) Water added slowly in depression in centre and mixed as added until whole has a quaky, jelly-like consistency.

CONCRETE (continued) PLACING

- (1) When concrete is thoroughly mixed, place without delay; concrete made with ordinary Portland cement should be placed within half an hour of mixing in summer and three-quarters of an hour in winter.
- (2) Place with care, avoiding chuting and dumping, which causes segregation of coarse from fine material.
- (3) Place as near as possible to final position; working concrete along in forms causes segregation.
- (4) Work thoroughly in mass of concrete against forms to ensure good packing.
- (5) When placing against hardened concrete—
 - (a) Thoroughly wire-brush surface and wash to remove all loose particles.
 - (b) Apply layer of mortar of same composition as new concrete (but without coarse aggregate), and of plastic consistency, to surface—preferably brushing in.
 - (c) Immediately place fresh concrete.

CURING.—As soon as placed, protect concrete against drying out by shading. When hard enough to resist finger impressions, cover, and keep moist for at least one week.

WATERTIGHT CONCRETE.—Essential requirements for watertight concrete are as follows:—

- (1) Suitable design (to prevent cracking).
- (2) Sound, well-graded aggregates of low porosity.
- (3) Limited amount of mixing water.
- (4) Plastic, workable mixes.
- (5) Thorough mixing.
- (6) Proper placing and compacting.
- (7) Favourable curing conditions.

Waterproofing admixtures may provide additional insurance where low hydraulic heads only are to be resisted, but are not a substitute for good concrete.

COLOURED CONCRETE.—Colour pigments for use with cement must be—

- (1) Proof against lime, alkali, and action of direct sunlight.
- (2) Very finely ground, insoluble in water, and uniform in shade and quality.

The most suitable pigments are metallic oxides of a high degree of purity; low-grade pigments must be used in larger quantities, thereby reducing strength and quality of the concrete or mortar. A pure white is obtained only by use of white Portland cement with white sand, crushed marble, etc.

For economy, pigment and cement should be ground together; or, failing this, sieved together to a uniform colour throughout. A steel floating trowel gives a darker colour than a wooden float. Concrete cured in sunlight will be given a lighter colour than if cured in shade.

Coloured concrete is darker when wet than when dry. Trowelling on partly hardened surfaces causes colour blotches. Amount of pigment depends on a number of factors, and may vary from about 5 to 12 lb. per bag of cement.

CONCRETE (continued)

Use of the following pigments is recommended:—

Colour	Pigment
Red	Iron oxide.
Yellow	Iron oxide or hydroxide.
Brown	Iron oxide.
Black	Iron oxide or manganese dioxide. (Lamp black should NOT be used.)
Green	Chromium oxide.
Blue	Cobalt oxide.

Pigments may be mixed to give other effects as desired.

Coloured cements with white cement as a base are available.

FORMWORK.—The following points must be observed if a good concrete job is to be obtained at lowest cost.

- (1) Shuttering must be strong and rigid.
- (2) It must be designed for removal without excessive damage to concrete or timber.
- (3) It must be carefully made and erected to avoid gaps between boards, panels, etc., which may require filling with clay, putty, or other suitable material.
- (4) It must be treated to prevent concrete from adhering to it.
- (5) It must not be removed until concrete has sufficient strength; this period will be longer in cold than in warm weather.

REINFORCED CONCRETE.—Concrete is strong in compression, weak in tension; hence, when tensile stresses are to be carried, steel bars are used to reinforce the concrete. Determination of the amount and placing of the steel require expert knowledge, and are not matters for the layman; once determined, the steel must be accurately placed on the job.

PAVING AND RENDERING.—Materials required for 1,000 sq. ft. of surface:—

Paving thickness	Concrete mix					
	1:2:4			1:2½:5		
	Cement (bags)	Sand (c.ft.)	Metal (c.ft.)	Cement (bags)	Sand (c.ft.)	Metal (c.ft.)
2" (Light foot traffic)	38	75	150	31	77	154
3" (Normal footpath)	56	112	224	46	115	230
4" (Car drives, etc.)	76	150	298	62	154	308
6" (Heavy trucks, etc.)	112	224	448	92	230	460

Render thickness	1:2		1:2½		1:3	
	Cement (bags)	Sand (c.ft.)	Cement (bags)	Sand (c.ft.)	Cement (bags)	Sand (c.ft.)
½"	20	40	17	43	15	44
¾"	30	60	25	63	22	68
1"	40	80	34	85	30	88

BRICKS AND BRICKWORK

1,000 common bricks weigh about $3\frac{1}{2}$ tons.
 Standard brick size = $9'' \times 4\frac{1}{2}'' \times 3''$.
 Standard measure = 1 rod = $16\frac{1}{2}' \times 16\frac{1}{2}' \times 13\frac{1}{2}''$.
 1 Rod = 272 super feet $\times 1\frac{1}{2}$ brick thickness.
 = 408 " " $\times 1$ " "
 = 816 " " $\times \frac{1}{2}$ " "
 = 306 cubic feet or $11\frac{1}{3}$ cubic yards.

QUANTITIES OF MATERIALS REQUIRED FOR ONE UNIT OF BRICKWORK

Unit Quantity	Bricks		Mortar: Lime or Cement Cu. Ft.	2:1 Cement Mortar	
	No.	Cu. Ft.		Cement	Sand
				Bags	Cu. Ft.
<u>$\frac{1}{4}$" Joints</u>					
1 Rod	3,703	260	48	23	46
1 Cu. Yd.	327	22.97	4.03	2	4
<u>$\frac{3}{8}$" Joints</u>				3:1 Cement Mortar	
1 Rod	3,429	241	65	23.2	70
1 Cu. Yd.	302	21.27	5.73	2.04	6.12

Weight of Brickwork.—In lime mortar, about 112 lb. per cu. ft.
 In cement mortar, about 120 lb. per cu. ft.

Paving requires per sq. yd.—32 bricks on flat; 48 bricks on edge.

MORTAR FOR BRICKWORK:

- Cement mortar should be used where a high degree of impermeability is required, as in walls and piers below dampcourse, or where high strength is required, as in piers or walls carrying heavy loads. Usual proportions are 1 part cement to 3 parts sand, or 1 part cement to 4 parts sand by volume.
- Lime mortar is frequently used where strength is of less importance; it is more workable than cement mortar, resulting in a higher rate of bricklaying. Usual proportions are 3 to 4 parts of sand to 1 part of hydrated lime or lime putty by volume.
- Composition mortars consist of cement, hydrated lime, and sand, and are intermediate between cement and lime mortars in regard to strength and workability. Proportions used vary from a cement mortar with added lime equal to 10% of cement volume (to improve workability) to a lime mortar gauged with 10% cement immediately before use to improve robustness of the job; satisfactory proportions for normal brickwork are 1 part cement to 1 part hydrated lime or lime putty to 6 parts sand by volume.

LABOUR.—A good tradesman should lay, per 8-hour day, 600/700 bricks of $9''$ work in cement-struck joint; 700/1,000 bricks of $14''$ work in lime or compo. mortar; 500 bricks in selected face work.

BRICKWORK DIMENSIONS

N.S.W. STANDARDS

NOTES.—¹/₈" should be added for bed under sills bearers, etc.
Openings are ³/₄" longer than piers. Four courses equals 1'-1¹/₂".

Courses or Bricks	Piers	Openings	Heights	Courses or Bricks	Piers	Openings	Heights
$\frac{1}{2}$	4-5/16"	5-1/16"		13	10' 1-1/2"	10' 2-1/4"	3' 7-7/8"
1	9"	9-3/4"	3-3/8"	13 $\frac{1}{2}$	10' 6-3/16"	10' 6-15/16"	
1 $\frac{1}{2}$	1' 1-11/16"	1' 2-7/16"		14	10' 10-7/8"	10' 11-5/8"	3' 11-1/4"
2	1' 6-3/8"	1' 7-1/8"	6-3/4"	14 $\frac{1}{2}$	11' 3-9/16"	11' 4-5/16"	
2 $\frac{1}{2}$	1' 11-1/8"	1' 11-7/8"		15	11' 8-1/4"	11' 9"	4 2-5/8"
3	2' 3-3/4"	2' 4-1/2"	10-1/8"	15 $\frac{1}{2}$	12' 0-5/16"	12' 1-11/16"	
3 $\frac{1}{2}$	2' 8-7/16"	2' 9-3/16"		16	12' 5-5/8"	12' 6-3/8"	4' 6"
4	3' 1-1/8"	3' 1-1/8"	1' 1-1/2"	16 $\frac{1}{2}$	12' 10-5/16"	12' 11-1/16"	
4 $\frac{1}{2}$	3' 5-13/16"	3' 6-9/16"		17	13' 3"	13' 3-3/4"	4' 9-3/8"
5	3' 10-1/2"	3' 11-1/4"	1' 4-7/8"	17 $\frac{1}{2}$	13' 7-11/16"	13' 8-7/16"	
5 $\frac{1}{2}$	4' 3-3/16"	4' 3-15/16"		18	14' 0-3/8"	14' 1-1/8"	5' 0-3/4"
6	4' 7-7/8"	4' 8-5/8"	1' 8-1/4"	18 $\frac{1}{2}$	14' 5-1/16"	14' 5-13/16"	
6 $\frac{1}{2}$	5' 0-7/16"	5' 0-13/16"		19	14' 9-3/4"	14' 10-1/2"	5' 4-1/8"
7	5' 5-1/4"	5' 6"	1' 11-5/8"	19 $\frac{1}{2}$	15' 2-7/16"	15' 3-3/16"	
7 $\frac{1}{2}$	5' 9-15/16"	5' 10-11/16"		20	15' 7"	15' 7-7/8"	5' 7-1/2"
8	6' 2-5/8"	6' 3-3/8"	2' 3"	20 $\frac{1}{2}$	15' 11-13/16"	16' 0-9/16"	
8 $\frac{1}{2}$	6' 7-5/16"	6' 8-1/16"		21	16' 4-1/2"	16' 5-1/4"	5' 10-7/8"
9	7' 0"	7' 0-3/4"	2' 6-3/8"	21 $\frac{1}{2}$	16' 9-3/16"	16' 9-15/16"	
9 $\frac{1}{2}$	7' 4-11/16"	7' 5-7/16"		22	17' 1-7/8"	17' 1-7/8"	6' 2-1/4"
10	7' 9-3/8"	7' 0-1/8"	2' 9-3/4"	22 $\frac{1}{2}$	17' 6-9/16"	17' 7-5/16"	
10 $\frac{1}{2}$	8' 1-15/16"	8' 2-11/16"		23	17' 11-1/4"	18' 0"	6' 5-5/8"
11	8' 6-3/4"	8' 7-1/2"	3' 1-1/8"	23 $\frac{1}{2}$	18' 3-13/16"	18' 4-9/16"	
11 $\frac{1}{2}$	8' 11-7/16"	9' 1-3/16"		24	18' 8-5/8"	18' 9-3/8"	6' 9"
12	9' 4-1/8"	9' 4-7/8"		24 $\frac{1}{2}$	19' 1-5/16"	19' 2-1/16"	
12 $\frac{1}{2}$	9' 8-3/16"	9' 8-15/16"		25		10' 6-3/4"	7' 0-3/8"

BRITISH WEIGHTS AND MEASURES

LENGTH

12 inches (ins.)	=	1 Foot (ft.)	4 Rods	} = 1 Chain
3 Feet	}	= 1 Yard (yd.)	22 Yards	
36 Inches			100 Links	
5½ Yards	}	= 1 Rod, pole, or perch	8 Furlongs	} = 1 Mile
16½ Feet			80 Chains	
40 Rods	=	1 Furlong	320 Rods	
			1760 Yards	

SQUARE

Square Inches	Square Feet	Square Yards	Square Rods	Square Chains	Acres	
144	1	—	—	—	—	1 sq. ft.
1,296	9	1	—	—	—	1 sq. yd.
39,204	272¼	30¼	1	—	—	1 sq. rod
627,264	4,356	484	16	1	—	1 sq. chain
6,272,640	43,560	4,840	160	10	1	1 acre
4,014,489,600	27,878,400	3,097,600	102,400	2,560	640	1 sq. mile

CUBIC

1 Cubic Ft.	=	1728 cubic ins.	1 Perch of stone	=	24½ cubic ft.
1 Cubic Yd.	=	27 cubic ft.	1 Bushel	=	1.284 cubic ft.
1 Cord Ft.	=	16 cubic ft.	1 Gall. of water	=	0.161 cubic ft.
1 Cord of wood	=	128 cubic ft.	1 Shipping ton	=	40 cubic ft.

AVOIRDUPOIS

16 Drams	=	1 Ounce (oz.)	=	437.5 Grains
16 Ounces	=	1 Pound (lb.)	=	7,000 Grains
14 Pounds	=	1 Stone		
2 Stone	=	1 Quarter	=	28 Pounds
4 Quarters	=	1 Hundredweight (cwt.)	=	112 Pounds
20 Cwts.	=	1 Ton	=	2,240 Pounds
100 Pounds	=	1 Hundredweight (cwt.) (U.S.A.)		
2,000 Pounds	=	1 Short Ton (U.S.A.)		

CAPACITY

4 Gills	=	1 Pint	4 Pecks	=	1 Bushel
2 Pints	=	1 Quart	8 Bushels	=	1 Quarter
4 Quarts	=	1 Gallon	5 Quarters	=	1 Load
2 Gallons	=	1 Peck	1 Bag	=	3 Bushels

APPROXIMATE EQUIVALENTS

1 Millimetre	=	1/25th of inch	1 Kilogramme	=	2¼ lbs.
2½ Centimetres	=	1 inch	1,000 Kilogrammes	=	1 Ton
1 Metre	=	39⅓ inches	6½ Sq. Centimetres	=	1 Sq. Inch
1 Kilometre	=	5 Furlongs (⅕ m.)	1 Sq. Metre	=	10¾ Sq. ft.

(See Conversion Table, page 153)

WEIGHTS OF VARIOUS MATERIALS

IN LBS. PER CUBIC FOOT

Alcohol, Commercial	52	Lime	64
Acid—Hydrochloric	75	Limestone and Marbles	168
Nitric	76	Malt	27
Sulphuric	115	Masonry of granite or	
Aluminium	162	limestone, well dressed	165
Apples	38	Masonry of mortar rubble	154
Asbestos	192	Masonry of dry rubble,	
Asphalt pavement	130	well scabbled	138
Ashes	40	Masonry of sandstone,	
Barley	38	well dressed	144
Beans, White	48	Milk	65
Beer	65	Mortar, hardened	103
Books in Library	30	Mud—dry, close	80-110
Bran	14	wet, fluid (mix)	120
Brass (Copper and Zinc)		Oil—Linseed	59
cast	504	Olive	57
Brass, rolled	524	Turpentine	54
Brick—pressed	150	Paper—Calendered, book	50
in cement mortar	120	Manila	59
interior	100	News	38
stone faced	140	Strawboard	33
Brickwork	112	Super-calendered	69
Cabbage	40	Paving stone	150
Cement	94	Peas	48
Chalk	156	Pianos (each)	400-500
Charcoal	30	Petroleum	55
Cheese	30	Potatoes	48
Clay—Potters', dry	119	Rice	35
Lump, loose	63	Rye	45
Clinker	85	Salt—Coarse	45
Coal—bituminous, solid	84	Table	49
bituminous, loose	49	Sand—well shaken	99-117
Coke	40	well set	120-140
Concrete	130	Sandstone	151
Copper	545	Shales	162
Cork	15	Silver	655
Cotton goods	25	Slate	175
Crowd of men	120	Snow—Fresh	5.12
Earth—loam, dry	76	Wet	15.20
self-flowing mud	108	Steel	490
Eggs	68	Straw	19
Glass—window	157	Sugar	100
Granite	170	Sulphur	125
Gravel (see Sand)		Tar	63
Gypsum	142	Tin—Cast	459
Hay—baled	24	Turf	20-30
Ice	58	Vinegar	68
Iron—cast	450	Water	62.4
wrought	480	Water—Sea	64
Lead	711	Wax—Bees'	60.5
Leather—sole, in piles	17	Wheat	50
		Zinc	437.5

GENERAL CONVERSION TABLE

Multiply by	To Convert	Into	
14.696	Atmospheres	Lb./sq. in.	.068
1013.3	"	Millebars	.000987
33.9	"	Feet of Water	.0295
.556	B.Th.U.	C.H.U.	1.8
778.3	"	Ft. lb.	.00129
3.929×10^{-4}	"	H.P. Hours	2,525.06
16.387	Cubic inches	Cubic cons.	.061
28.316	Cubic feet	Litres	.0353
6.229	"	Gallons (Imp.)	.161
.765	Cubic yards	Cub. metres	1.308
50.803	Cwt.	Kilogrammes	.0197
.0175	Degrees	Radians	57.296
30.48	Feet	Centimetres	.0328
.138	Foot-lb.	K'grammetres	7.233
.33	Foot-tons	Tonne-metres	3
4.546	Gallons (Imp.)	Litres	.22
10	Gallons of water ...	Pounds	.1
1.201	Gallons (Imp.)	Gallons (U.S.A.) ...	.833
1.014	Horse-power	Force-de-cheval	.986
745.7	"	Watts	.00134
33,000	"	Ft. lb./min.	1/33,000
76.04	"	Kgm./sec.	.0131
2.54	Inches	Cms.	.3937
.0736	Inches of water	Inches of Mercury .	13.595
.738	Joules	Ft. lb.	1.356
1.152	Knots	Miles/hour	.868
70.306	Lb./sq. in.	Gm./sq. cm.	.0142
2.306	"	Head of Water (ft.)	.434
.7	"	"	1.429
4.882	Lb./sq. ft.	Kgm./sq. metre	.205
16.018	Lb./cub. ft.	Kgm./cub. metre ...	.0624
.593	Lb./cub. yd.	"	1.686
16.093	Miles	Metres	.000621
88	Miles/Hour	Ft./min.	.0114
1.462	"	Ft./sec.	.682
196.85	Metres/Sec.	Ft./min.	.00508
1.152	Nautical miles	Statute Miles	.868
28.35	Ounces	Grammes	.0353
.454	Pounds (Avoir.)	Kilogrammes	2.205
.454	Pounds of Water ...	Litres	2.202
6.452	Square inches	Square cms.	.155
.093	Square feet	Square metres	10.764
.836	Square yards	"	1.196
1.12	Tons	Short tons (U.S.A.)	.893
1016	"	Kilogrammes	.000984
1.575	Tons/sq. in.	Kgm./sq. mm.	.625
44.26	Watts	Ft. lb./min.	.0227
.102	"	Kgm./sec.	9.807
914	Yards	Metres	1.094
	To Obtain	From	Multiply by above

ENGINEERING CONVERSION FACTORS

Multiply	By	To Obtain
Acres	4.04687×10^{-3}	Square kilometres
Acres	1076.39	Square feet
Board feet	144 sq. in x 1 in.	Cubic inches
Board feet	.0833	Cubic feet
Centimetres	3.28083×10^{-2}	Feet
Centimetres	.3937	Inches
Cubic centimetres ..	3.53145×10^{-5}	Cubic feet
Cubic centimetres ..	6.102×10^{-2}	Cubic inches
Cubic feet	2.8317×10^4	Cubic centimetres
Cubic feet	2.8317×10^{-3}	Cubic metres
Cubic feet	6.22905	Gallons, British Imperial
Cubic feet	28.3170	Litres
Cubic feet	2.38095×10^{-3}	Tons, British shipping
Cubic feet	.025	Tons, U.S. shipping
Cubic inches	16.38716	Cubic centimetres
Cubic metres	35.3145	Cubic feet
Cubic metres	1.30794	Cubic yards
Cubic yards	.764559	Cubic metres
Degrees angular	.0174533	Radians
Degrees Fah. (less 32°F).	.5556	Degrees Centigrade
Degrees Centigrade ..	1.8	Deg. Fah. (less 32°F.)
Foot pounds	.13826	Kilogram metres
Feet	30.4801	Centimetres
Feet	.304801	Metres
Feet	304.801	Millimetres
Feet	1.64468×10^{-4}	Miles, nautical
Gallons, British Imperial	.160538	Cubic feet
Gallons, British Imperial	1.20091	Gallons, U.S.
Gallons, British Imperial	4.54596	Litres
Gallons, U.S.	.832702	Gallons, British Imperial
Gallons, U.S.	3.78543	Litres
Grams, metric	2.20462×10^{-3}	Pounds, Avoirdupois
Horse-power, metric ..	.98632	Horse-power, U.S.
Inches	2.54001	Centimetres
Inches	2.54001×10^{-2}	Metres
Inches	25.4001	Millimetres
Kilograms	2.20462	Pounds
Kilograms	9.84206×10^{-4}	Long tons
Kilograms	1.10231×10^{-3}	Short tons
Kgs. metres	7.233	Foot pounds
Kgs. per metre	.671972	Pounds per foot
Kgs. per sq. centimetre	14.2234	Pounds per square inch
Kgs. per sq. metre ..	.204817	Pounds per square foot
Kgs. per sq. metre ..	9.14362×10^{-5}	Long tons per sq. foot
Kgs. per sq. millimetre	1422.34	Pounds per square inch
Kgs. per sq. millimetre	.634973	Long tons per sq. inch
Kgs. per cubic metre ..	6.24283×10^{-2}	Pounds per cubic foot
Kilometres	.621.37	Miles, statute
Kilometres	.53959	Miles, Nautical
Litres	.219975	Gallons, British Imperial
Litres	.26417	Gallons, U.S.

ENGINEERING CONVERSION FACTORS

Multiply	By	To Obtain
Litres	3.53145 x 10 ⁻²	Cubic feet
Metres	3.28083	Feet
Metres	39.37	Inches
Metres	1.09361	Yards
Miles, Statute	1.60935	Kilometres
Miles, Statute	.8684	Miles, nautical
Miles, Nautical	6080.204	Feet
Miles, Nautical	1.85325	Kilometres
Miles, Nautical	1.1516	Miles, statute
Millimetres	3.28083 x 10 ⁻³	Feet
Millimetres	3.937 x 10 ⁻²	Inches
Pounds, Avoirdupois ..	453.592	Grams, metric
Pounds, Avoirdupois ..	.453592	Kilograms
Pounds, Avoirdupois ..	4.464 x 10 ⁻⁴	Tons, long
Pounds, Avoirdupois ..	4.53592 x 10 ⁻⁴	Tons, metric
Pounds, per foot	1.48816	Kilograms per metre
Pounds, per square foot	4.88241	Kilograms per sq. metre
Pounds, per square inch	7.031 x 10 ⁻²	Kgs. per sq. centimetre
Pounds, per square inch	7.031 x 10 ⁻²	Kgs. per sq. centimetre
Pounds, per square inch	7.031 x 10 ⁻⁴	Kgs. per sq. millimetre
Pounds, per cubic foot	16.0184	Kgs. per cubic metre
Radians	57.29578	Degrees, angular
Square centimetres ..	.1550	Square inches
Square feet	9.29034 x 10 ⁻⁴	Acres
Square feet	.0929034	Square metres
Square inches	6.45163	Square centimetres
Square inches	645.163	Square millimetres
Square kilometres ..	247.104	Acres
Square kilometres ..	.3861	Square miles
Square metres	10.7639	Square feet
Square metres	1.19599	Square yards
Square miles	2.590	Square kilometres
Square millimetres ..	1.550 x 10 ⁻³	Square inches
Square yards	.83613	Square metres
Tons, long	1016.05	Kilograms
Tons, long	2,240	Pounds
Tons, long	1,01605	Tons, metric
Tons, long	1.120	Tons, short
Tons, long, per sq. foot	1.09366 x 10 ⁻⁴	Kilograms per sq. metre
Tons, long, per sq. inch	1.57494	Kgs. per sq. millimetre
Tons, metric	2204.62	Pounds
Tons, metric	.98421	Tons, long
Tons, metric	1.10231	Tons, short
Tons, short	907.185	Kilograms
Tons, short	.892857	Tons, long
Tons, short	.907185	Tons, metric
Tons, British shipping ..	42.00	Cubic feet
Tons, British shipping ..	.952381	Tons, U.S. shipping
Tons, U.S. shipping ..	40.00	Cubic feet
Tons, U.S. shipping ..	1.050	Tons, British shipping
Yards	.914402	Metres

GEOMETRY AND MENSURATION

CIRCLE.— Circumference = diameter $\times \frac{22}{7}$ (or 3.1416).

Area = diameter² $\times$ 0.7854.

Area of sector of circle = length of arc $\times$ half radius.

Area of segment of circle = area of sector, less area of triangle.

Side of square of area equal to circle = 0.8852 diameter.

Diameter of circle equal in area to square = 1.1284 side.

SPHERE.— Surface area = 3.1416 $\times$ diameter²

Volume = 0.5236 diameter³.

AREAS generally.

Square, rectangle, rhombus, or rhomboid = base $\times$ height.

Triangle = half base $\times$ perpendicular height.

Trapezoid = half sum of two parallel sides $\times$ height.

Area of any figure of four or more unequal sides is found by dividing it into triangles, finding areas of each, and adding together.

Regular polygon (circumscribe circle) = half radius of circle $\times$ length of one side $\times$ number of sides.

Parabola = base $\times$ height $\times$ 2/3.

Ellipse = long axis $\times$ short axis $\times$ 0.7854.

SURFACES AND VOLUMES

CUBES.— a = length of one side, volume = a^3 , surface area = $6a^2$.

RECTANGULAR PRISM.— Volume = area of base $\times$ height = $bl \times h$.

Total surface area = $2(bl + lh + bh)$.

REGULAR PRISM.— Volume = $\frac{1}{2}n \times r \times a \times h$, where n = number of sides, r = radius of inscribed circle, a = length of side.

CYLINDER (Right Circular).— Volume = 0.7854 $\times$ diameter² $\times$ height

Lateral surface area, 3.1416 $\times$ diameter $\times$ height.

Total surface area = 3.1416 (diameter $\times$ height + diameter).

ANY PRISM OR CYLINDER.— Volume = $h \times$ area of base. Lateral surface area = length of cylinder $\times$ perimeter of normal sector.

REGULAR PYRAMID OR CONE.— Volume = $1/3$ (area of base $\times$ height). Lateral area of regular figure = half (perimeter of base $\times$ slant height).

ANY PYRAMID OR CONE.— Volume = $1/3$ (area of base $\times$ distance from vertex to plane of base).

FRUSTUM OF ANY PYRAMID OR CONE.— Volume = $h/3 (A_1 + A_2 + \sqrt{A_1 A_2})$, where A_1 and A_2 are the areas of bases made by parallel planes.

LOGARITHMS

	0	1	2	3	4	5	6	7	8	9	1	3	5	7	9
10	0000	0043	0086	0128	0170	0212	0253	0294	0334	0374	4	12	21	29	37
11	0414	0453	0492	0531	0569	0607	0645	0682	0719	0755	4	11	19	26	34
12	0792	0828	0864	0899	0934	0969	1004	1038	1072	1106	3	10	17	24	31
13	1139	1173	1206	1239	1271	1303	1335	1367	1399	1430	3	10	16	23	29
14	1461	1492	1523	1553	1584	1614	1644	1673	1703	1732	3	9	15	21	27
15	1761	1790	1818	1847	1875	1903	1931	1959	1987	2014	3	8	14	20	25
16	2041	2068	2095	2122	2148	2175	2201	2227	2253	2279	3	8	13	18	24
17	2304	2330	2355	2380	2405	2430	2455	2480	2504	2529	2	7	12	17	22
18	2553	2577	2601	2625	2648	2672	2695	2718	2742	2765	2	7	12	16	21
19	2788	2810	2833	2856	2878	2900	2923	2945	2967	2989	2	7	11	16	20
20	3010	3032	3054	3075	3096	3118	3139	3160	3181	3201	2	6	11	15	19
21	3222	3243	3263	3284	3304	3324	3345	3365	3385	3404	2	6	10	14	18
22	3424	3444	3464	3483	3502	3522	3541	3560	3579	3598	2	6	10	14	17
23	3617	3636	3655	3674	3692	3711	3729	3747	3766	3784	2	6	9	13	17
24	3802	3820	3838	3856	3874	3892	3909	3927	3945	3962	2	5	9	12	16
25	3979	3997	4014	4031	4048	4065	4082	4099	4116	4133	2	5	9	12	15
26	4150	4166	4183	4200	4216	4232	4249	4265	4281	4298	2	5	8	11	15
27	4314	4330	4346	4362	4378	4393	4409	4425	4440	4456	2	5	8	11	14
28	4472	4487	4502	4518	4533	4548	4564	4579	4594	4609	2	5	8	11	14
29	4624	4639	4654	4669	4683	4698	4713	4728	4742	4757	1	4	7	10	13
30	4771	4786	4800	4814	4829	4843	4857	4871	4886	4900	1	4	7	10	13
31	4914	4928	4942	4955	4969	4983	4997	5011	5024	5038	1	4	7	10	12
32	5051	5065	5079	5092	5105	5119	5132	5145	5159	5172	1	4	7	9	12
33	5185	5198	5211	5224	5237	5250	5263	5276	5289	5302	1	4	6	9	12
34	5315	5328	5340	5353	5366	5378	5391	5403	5416	5428	1	4	6	9	11
35	5441	5453	5465	5478	5490	5502	5514	5527	5539	5551	1	4	6	9	11
36	5563	5575	5587	5599	5611	5623	5635	5647	5658	5670	1	4	6	8	11
37	5682	5694	5705	5717	5729	5740	5752	5763	5775	5786	1	3	6	8	11
38	5798	5809	5821	5832	5843	5855	5866	5877	5888	5899	1	3	6	8	10
39	5911	5922	5933	5944	5955	5966	5977	5988	5999	6010	1	3	5	8	10
40	6021	6031	6042	6053	6064	6075	6085	6096	6107	6117	1	3	5	8	10
41	6128	6138	6149	6160	6170	6180	6191	6201	6212	6222	1	3	5	7	9
42	6232	6243	6253	6263	6274	6284	6294	6304	6314	6325	1	3	5	7	9
43	6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	1	3	5	7	9
44	6435	6444	6454	6464	6474	6484	6493	6503	6513	6522	1	3	5	7	9
45	6532	6542	6551	6561	6571	6580	6590	6599	6609	6618	1	3	5	7	9
46	6628	6637	6646	6656	6665	6675	6684	6693	6702	6712	1	3	5	7	8
47	6721	6730	6739	6749	6758	6767	6776	6785	6794	6803	1	3	5	6	8
48	6812	6821	6830	6839	6848	6857	6866	6875	6884	6893	1	3	4	6	8
49	6902	6911	6920	6928	6937	6946	6955	6964	6972	6981	1	3	4	6	8
50	6990	6998	7007	7016	7024	7033	7042	7050	7059	7067	1	3	4	6	8
51	7076	7084	7093	7101	7110	7118	7126	7135	7143	7152	1	3	4	6	8
52	7160	7168	7177	7185	7193	7202	7210	7218	7226	7235	1	2	4	6	7
53	7243	7251	7259	7267	7275	7284	7292	7300	7308	7316	1	2	4	6	7
54	7324	7332	7340	7348	7356	7364	7372	7380	7388	7396	1	2	4	6	7

Difference 2 4 6 8 obtained by interpolation.

LOGARITHMS

	0	1	2	3	4	5	6	7	8	9	1	3	5	7	9
55	7404	7412	7419	7427	7435	7443	7451	7459	7466	7474	1	2	4	5	7
56	7482	7490	7497	7505	7513	7520	7528	7536	7543	7551	1	2	4	5	7
57	7559	7566	7574	7582	7589	7597	7604	7612	7619	7627	1	2	4	5	7
58	7634	7642	7649	7657	7664	7672	7679	7686	7694	7701	1	2	4	5	7
59	7709	7716	7723	7731	7738	7745	7752	7760	7767	7774	1	2	4	5	7
60	7782	7789	7796	7803	7810	7818	7825	7832	7839	7846	1	2	4	5	6
61	7853	7860	7868	7875	7882	7889	7896	7903	7910	7917	1	2	4	5	6
62	7924	7931	7938	7945	7952	7959	7966	7973	7980	7987	1	2	3	5	6
63	7993	8000	8007	8014	8021	8028	8035	8041	8048	8055	1	2	3	5	6
64	8062	8069	8075	8082	8089	8096	8102	8109	8116	8122	1	2	3	5	6
65	8129	8136	8142	8149	8156	8162	8169	8176	8182	8189	1	2	3	5	6
66	8195	8202	8209	8215	8222	8228	8235	8241	8248	8254	1	2	3	5	6
67	8261	8267	8274	8280	8287	8293	8299	8306	8312	8319	1	2	3	5	6
68	8325	8331	8338	8344	8351	8357	8363	8370	8376	8382	1	2	3	4	6
69	8388	8395	8401	8407	8414	8420	8426	8432	8439	8445	1	2	3	4	6
70	8451	8457	8463	8470	8476	8482	8488	8494	8500	8506	1	2	3	4	6
71	8513	8519	8525	8531	8537	8543	8549	8555	8561	8567	1	2	3	4	5
72	8573	8579	8585	8591	8597	8603	8609	8615	8621	8627	1	2	3	4	5
73	8633	8639	8645	8651	8657	8663	8669	8675	8681	8686	1	2	3	4	5
74	8692	8698	8704	8710	8716	8722	8727	8733	8739	8745	1	2	3	4	5
75	8751	8756	8762	8768	8774	8779	8785	8791	8797	8802	1	2	3	4	5
76	8808	8814	8820	8825	8831	8837	8842	8848	8854	8859	1	2	3	4	5
77	8865	8871	8876	8882	8887	8893	8899	8904	8910	8915	1	2	3	4	5
78	8921	8927	8932	8938	8943	8949	8954	8960	8965	8971	1	2	3	4	5
79	8976	8982	8987	8993	8998	9004	9009	9015	9020	9025	1	2	3	4	5
80	9031	9036	9042	9047	9053	9058	9063	9069	9074	9079	1	2	3	4	5
81	9085	9090	9096	9101	9106	9112	9117	9122	9128	9133	1	2	3	4	5
82	9138	9143	9149	9154	9159	9165	9170	9175	9180	9186	1	2	3	4	5
83	9191	9196	9201	9206	9212	9217	9222	9227	9232	9238	1	2	3	4	5
84	9243	9248	9253	9258	9263	9269	9274	9279	9284	9289	1	2	3	4	5
85	9294	9299	9304	9309	9315	9320	9325	9330	9335	9340	1	2	3	4	5
86	9345	9350	9355	9360	9365	9370	9375	9380	9385	9390	1	2	3	4	5
87	9395	9400	9405	9410	9415	9420	9425	9430	9435	9440	0	1	2	3	4
88	9445	9450	9455	9460	9465	9469	9474	9479	9484	9489	0	1	2	3	4
89	9494	9499	9504	9509	9513	9518	9523	9528	9533	9538	0	1	2	3	4
90	9542	9547	9552	9557	9562	9566	9571	9576	9581	9586	0	1	2	3	4
91	9590	9595	9600	9605	9609	9614	9619	9624	9628	9633	0	1	2	3	4
92	9638	9643	9647	9652	9657	9661	9666	9671	9675	9680	0	1	2	3	4
93	9685	9689	9694	9699	9703	9708	9713	9717	9722	9727	0	1	2	3	4
94	9731	9736	9741	9745	9750	9754	9759	9763	9768	9773	0	1	2	3	4
95	9777	9782	9786	9791	9795	9800	9805	9809	9814	9818	0	1	2	3	4
96	9823	9827	9832	9836	9841	9845	9850	9854	9859	9863	0	1	2	3	4
97	9868	9872	9877	9881	9886	9890	9894	9899	9903	9908	0	1	2	3	4
98	9912	9917	9921	9926	9930	9934	9939	9943	9948	9952	0	1	2	3	4
99	9956	9961	9965	9969	9974	9978	9983	9987	9991	9996	0	1	2	3	4

Common Logarithms = Hyperbolic Logarithms x 0.43429.

ANTILOGARITHMS

	0	1	2	3	4	5	6	7	8	9	1	3	5	7	9
.00	1000	1002	1005	1007	1009	1012	1014	1016	1019	1021	0	1	1	2	2
.01	1023	1026	1028	1030	1033	1035	1038	1040	1042	1045	0	1	1	2	2
.02	1047	1050	1052	1054	1057	1059	1062	1064	1067	1069	0	1	1	2	2
.03	1072	1074	1076	1079	1081	1084	1086	1089	1091	1094	0	1	1	2	2
.04	1096	1099	1102	1104	1107	1109	1112	1114	1117	1119	0	1	2	2	2
.05	1122	1125	1127	1130	1132	1135	1138	1140	1143	1146	0	1	1	2	2
.06	1148	1151	1153	1156	1159	1161	1164	1167	1169	1172	0	1	1	2	2
.07	1175	1178	1180	1183	1186	1189	1191	1194	1197	1199	0	1	1	2	2
.08	1202	1205	1208	1211	1213	1216	1219	1222	1225	1227	0	1	1	2	3
.09	1230	1233	1236	1239	1242	1245	1247	1250	1253	1256	0	1	1	2	3
.10	1259	1262	1265	1268	1271	1274	1276	1279	1282	1285	0	1	1	2	3
.11	1288	1291	1294	1297	1300	1303	1306	1309	1312	1315	0	1	2	2	3
.12	1318	1321	1324	1327	1330	1334	1337	1340	1343	1346	0	1	2	2	3
.13	1349	1352	1355	1358	1361	1365	1368	1371	1374	1377	0	1	2	2	3
.14	1380	1384	1387	1390	1393	1396	1400	1403	1406	1409	0	1	2	2	3
.15	1413	1416	1419	1422	1426	1429	1432	1435	1439	1442	0	1	2	2	3
.16	1445	1449	1452	1455	1459	1462	1466	1469	1472	1476	0	1	2	2	3
.17	1479	1483	1486	1489	1493	1496	1500	1503	1507	1510	0	1	2	2	3
.18	1514	1517	1521	1524	1528	1531	1535	1538	1542	1545	0	1	2	2	3
.19	1549	1552	1556	1560	1563	1567	1570	1574	1578	1581	0	1	2	2	3
.20	1585	1589	1592	1596	1600	1603	1607	1611	1614	1618	0	1	2	3	3
.21	1622	1626	1629	1633	1637	1641	1644	1648	1652	1656	0	1	2	3	3
.22	1660	1663	1667	1671	1675	1679	1683	1687	1690	1694	0	1	2	3	3
.23	1698	1702	1706	1710	1714	1718	1722	1726	1730	1734	0	1	2	3	4
.24	1738	1742	1746	1750	1754	1758	1762	1766	1770	1774	0	1	2	3	4
.25	1778	1782	1786	1791	1795	1799	1803	1807	1811	1816	0	1	2	3	4
.26	1820	1824	1828	1832	1837	1841	1845	1849	1854	1858	0	1	2	3	4
.27	1862	1866	1871	1875	1879	1884	1888	1892	1897	1901	0	1	2	3	4
.28	1905	1910	1914	1919	1923	1928	1932	1936	1941	1945	0	1	2	3	4
.29	1950	1954	1959	1963	1968	1972	1977	1982	1986	1991	0	1	2	3	4
.30	1995	2000	2004	2009	2014	2018	2023	2028	2032	2037	0	1	2	3	4
.31	2042	2046	2051	2056	2061	2065	2070	2075	2080	2084	0	1	2	3	4
.32	2089	2094	2099	2104	2109	2113	2118	2123	2128	2133	0	1	2	3	4
.33	2138	2143	2148	2153	2158	2163	2168	2173	2178	2183	0	1	2	3	4
.34	2188	2193	2198	2203	2208	2213	2218	2223	2228	2234	1	2	3	4	5
.35	2239	2244	2249	2254	2259	2265	2270	2275	2280	2286	1	2	3	4	5
.36	2291	2296	2301	2307	2312	2317	2323	2328	2333	2339	1	2	3	4	5
.37	2344	2350	2355	2360	2366	2371	2377	2382	2388	2393	1	2	3	4	5
.38	2399	2404	2410	2415	2421	2427	2432	2438	2443	2449	1	2	3	4	5
.39	2455	2460	2466	2472	2477	2483	2489	2495	2500	2506	1	1	3	4	5
.40	2512	2518	2523	2529	2535	2541	2547	2553	2559	2564	1	2	3	4	5
.41	2570	2576	2582	2588	2594	2600	2606	2612	2618	2624	1	2	3	4	5
.42	2630	2636	2642	2649	2655	2661	2667	2673	2679	2685	1	2	3	4	6
.43	2692	2698	2704	2710	2716	2723	2729	2735	2742	2748	1	2	3	4	6
.44	2754	2761	2767	2773	2780	2786	2793	2799	2805	2812	1	2	3	4	6
.45	2818	2825	2831	2838	2844	2851	2858	2864	2871	2877	1	2	3	5	6
.46	2884	2891	2897	2904	2911	2917	2924	2931	2938	2944	1	2	3	5	6
.47	2951	2958	2965	2972	2979	2985	2992	2999	3006	3013	1	2	3	5	6
.48	3020	3027	3031	3041	3048	3055	3062	3069	3076	3083	1	2	4	5	6
.49	3090	3097	3105	3112	3119	3126	3133	3141	3148	3155	1	2	3	5	6

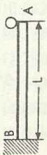
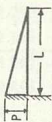
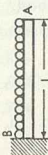
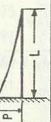
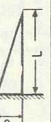
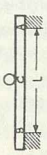
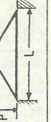
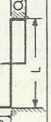
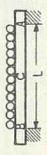
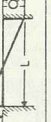
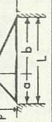
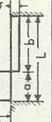
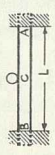
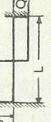
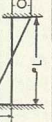
Difference 2 4 6 8 obtained by interpolation.

ANTILOGARITHMS

	0	1	2	3	4	5	6	7	8	9	1	3	5	7	9
.50	3162	3170	3177	3184	3192	3199	3206	3214	3221	3228	1	2	4	5	7
.51	3236	3243	3251	3258	3266	3273	3281	3289	3296	3304	1	2	4	5	7
.52	3311	3319	3327	3334	3342	3350	3357	3365	3373	3381	1	2	4	5	7
.53	3388	3396	3404	3412	3420	3428	3436	3443	3451	3459	1	2	4	6	7
.54	3467	3475	3483	3491	3499	3508	3516	3524	3532	3540	1	2	4	6	7
.55	3548	3556	3565	3573	3581	3589	3597	3606	3614	3622	1	2	4	6	7
.56	3631	3639	3648	3656	3664	3673	3681	3690	3698	3707	1	3	4	6	8
.57	3715	3724	3733	3741	3750	3758	3767	3776	3784	3793	1	3	4	6	8
.58	3802	3811	3819	3828	3937	3846	3855	3864	3873	3882	1	3	4	6	8
.59	3890	3899	3908	3917	3926	3936	3945	3954	3963	3972	1	3	5	6	8
.60	3981	3990	3999	4009	4018	4027	4036	4046	4055	4064	1	3	5	6	8
.61	4074	4083	4093	4102	4111	4121	4130	4140	4150	4159	1	3	5	7	9
.62	4169	4178	4188	4198	4207	4217	4227	4236	4246	4256	1	3	5	7	9
.63	4266	4276	4285	4295	4305	4315	4325	4335	4345	4355	1	3	5	7	9
.64	4365	4375	4385	4395	4406	4416	4426	4436	4446	4457	1	3	5	7	9
.65	4467	4477	4487	4498	4508	4519	4529	4539	4550	4560	1	3	5	7	9
.66	4571	4581	4592	4603	4613	4624	4634	4645	4656	4667	1	3	5	7	10
.67	4677	4688	4699	4710	4721	4732	4742	4753	4764	4775	1	3	5	8	10
.68	4786	4797	4808	4819	4831	4842	4853	4864	4875	4887	1	3	6	8	10
.69	4898	4909	4920	4932	4943	4955	4966	4977	4989	5000	1	3	6	8	10
.70	5012	5023	5035	5047	5058	5070	5082	5093	5105	5117	1	4	6	8	11
.71	5129	5140	5152	5164	5176	5188	5200	5212	5224	5236	1	4	6	8	11
.72	5248	5260	5272	5284	5297	5309	5321	5333	5346	5358	1	4	6	9	11
.73	5370	5383	5395	5408	5420	5433	5445	5458	5470	5483	1	4	6	9	11
.74	5495	5508	5521	5534	5546	5559	5572	5585	5598	5610	1	4	6	9	12
.75	5623	5636	5649	5662	5675	5689	5702	5715	5728	5741	1	4	7	9	12
.76	5754	5768	5781	5794	5808	5821	5834	5848	5861	5875	1	4	7	9	12
.77	5888	5902	5916	5929	5943	5957	5970	5984	5998	6012	1	4	7	10	12
.78	6026	6039	6053	6067	6081	6095	6109	6124	6138	6152	1	4	7	10	13
.79	6166	6180	6194	6209	6223	6237	6252	6266	6281	6295	1	4	7	10	13
.80	6310	6324	6339	6353	6368	6383	6397	6412	6427	6442	1	4	7	10	13
.81	6457	6471	6486	6501	6516	6531	6546	6561	6577	6592	2	5	8	11	14
.82	6607	6622	6637	6653	6668	6683	6699	6714	6730	6745	2	5	8	11	14
.83	6761	6776	6792	6808	6823	6839	6855	6871	6887	6902	2	5	8	11	14
.84	6918	6934	6950	6966	6982	6998	7015	7031	7047	7063	2	5	8	11	15
.85	7079	7096	7112	7129	7145	7161	7178	7194	7211	7228	2	5	8	12	15
.86	7244	7261	7278	7295	7311	7328	7345	7362	7379	7396	2	5	8	12	15
.87	7413	7430	7447	7464	7482	7499	7516	7534	7551	7468	2	5	9	12	16
.88	7586	7603	7621	7638	7656	7674	7691	7709	7727	7745	2	5	9	12	16
.89	7762	7780	7798	7816	7834	7852	7870	7889	7907	7925	2	5	9	13	16
.90	7943	7962	7980	7998	8017	8035	8054	8072	8091	8110	2	6	9	13	17
.91	8128	8147	8166	8185	8204	8222	8241	8260	8279	8299	2	6	9	13	17
.92	8318	8337	8356	8375	8395	8414	8433	8453	8472	8492	2	6	10	14	17
.93	8511	8531	8551	8570	8590	8610	8630	8650	8670	8690	2	6	10	14	18
.94	8710	8730	8750	8770	8790	8810	8831	8851	8872	8892	2	6	10	14	18
.95	8913	8933	8954	8974	8995	9016	9036	9057	9078	9099	2	6	10	15	19
.96	9120	9141	9162	9183	9204	9226	9247	9268	9290	9311	2	6	11	15	19
.97	9333	9354	9376	9397	9419	9441	9462	9484	9506	9528	2	7	11	15	20
.98	9550	9572	9594	9616	9638	9661	9683	9705	9727	9750	2	7	11	16	20
.99	9772	9795	9817	9840	9863	9886	9908	9931	9954	9977	2	7	11	16	20

Difference 2 4 6 8 obtained by interpolation.

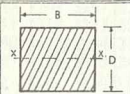
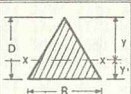
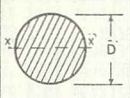
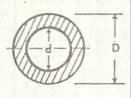
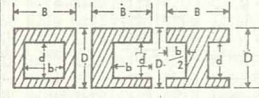
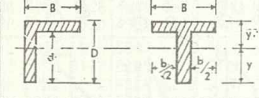
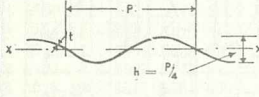
BEAM LOADING

Method of Loading	Location of Maximum		Bending Moment		Shearing Forces		Maximum Deflection
	Bending	Deflection	Maximum	Diagram	Maximum	Diagram	
	B	A	$P = WL$		$P = W$		$\frac{WL^3}{3EI}$
	B	A	$P = \frac{WL}{2}$		$P = W$		$\frac{WL^3}{8EI}$
	C	C	$P = \frac{WL}{4}$		$P = \frac{W}{2}$ $Q = \frac{W}{2}$		$\frac{WL^3}{48EI}$
	C	C	$P = \frac{WL}{8}$		$P = \frac{W}{2}$ $Q = \frac{W}{2}$		$\frac{5WL^3}{384EI}$
	C	D not max. at C	$P = \frac{Wab}{L}$		$P = \frac{Wb}{L}$ $Q = \frac{W_a}{L}$		$\frac{Wab}{48EI} \sqrt{\frac{b(2L-b)}{1}}$
	at A and C	C	$P = \frac{WL}{4}$ $Q = \frac{WL}{8}$		$P = \frac{W}{2}$ $Q = \frac{W}{2}$		$\frac{WL^3}{192EI}$
	A or B C	C	$P = \frac{WL}{8}$ $Q = \frac{WL}{12}$		$P = \frac{W}{2}$ $Q = \frac{W}{2}$		$\frac{WL^3}{384EI}$

Properties of Sections

I = Moment of Inertia.

Z = Modulus of Section.

	$I_{xx} = \frac{B D^3}{12}$ $Z_{xx} = \frac{B D^2}{6}$		$\bar{y} = \frac{2D}{3} \quad y = \frac{D}{3}$ $I_{xx} = \frac{B D^3}{36}$ $Z_{xx} = \frac{B D^2}{24}$
	$I = \frac{\pi D^4}{64} = .049 D^4$ $Z = \frac{\pi D^3}{32} = .098 D^3$		$I_{xx} = \frac{\pi [D^4 - d^4]}{64}$ $Z_{xx} = \frac{\pi [D^4 - d^4]}{32 D}$
	$I_{xx} = \frac{(B D^3 - b d^3)}{12}$ $Z_{xx} = \frac{(B D^3 - b d^3)}{6 D}$		
	$A = B D - b d$ $y = \frac{B D^2 - b d^2}{2 A}$ $I_{xx} = \frac{B D^3 - b d^3}{3} - A y^2$	$A = \text{Area}$ $y = D - y$ $Z = I/y$	
	$\text{For one pitch } P \text{ where } h = \frac{P}{4}$ $I = \frac{P^3 t}{106}$ $Z = \frac{P^3 t}{13.2}$		

Strength of Corrugated Sheets

In calculations involving corrugated Galvanized steel sheets, use the values of thickness for uncoated sheet as given by the Birmingham Gauge Table, with the exception of 26G. For 26G—thickness is .0162.

t = Thickness of sheet in inches.

P = Pitch of corrugations, e.g., 5", 3", 1".

S = Safe pressure lb. per sq. inch distributed load.

L = Unsupported length of sheet in inches, simply supported beam.

$$S = 9,000 \frac{P t}{L^2}$$

Example: 3" corrugations, 22G sheet— $t = 1/32$ ", $P = 3$ ".

$$S = \frac{9,000 \times 3}{32 \times L^2} = \frac{845}{L^2} \text{ lb./sq. in.}$$

26G Red Orb sheets have the same strength as 24G Blue Orb.

Squares, Cubes, Square Roots and Cube Roots

No.	Square	Cube	Sq. Root	Cube Root	No.	Square	Cube	Sq. Root	Cube Root
$\frac{1}{8}$	.015	.0019	.353	.5	$4\frac{1}{4}$	18.062	76.765	2.061	1.61
$\frac{1}{4}$	.062	.0156	.500	.620	$4\frac{1}{2}$	20.250	91.125	2.121	1.65
$\frac{3}{8}$	.140	.0527	.612	.721	$4\frac{3}{4}$	22.562	107.171	2.179	1.68
$\frac{1}{2}$	.250	.1250	.707	.793	5	25	125	2.236	1.71
$\frac{5}{8}$	.390	.244	.790	.855	$5\frac{1}{4}$	27.562	144.703	2.291	1.73
$\frac{3}{4}$	.562	.421	.866	.908	$5\frac{1}{2}$	30.250	166.375	2.345	1.76
$\frac{7}{8}$	.765	.670	.935	.956	$5\frac{3}{4}$	33.062	190.109	2.397	1.79
1	1	1	1.000	1	6	36	216	2.449	1.81
$1\frac{1}{8}$	1.265	1.423	1.060	1.04	$6\frac{1}{4}$	39.062	244.140	2.500	1.84
$1\frac{1}{4}$	1.562	1.953	1.118	1.07	$6\frac{1}{2}$	42.250	274.625	2.549	1.86
$1\frac{3}{8}$	1.890	2.599	1.172	1.11	$6\frac{3}{4}$	45.562	307.546	2.598	1.88
$1\frac{1}{2}$	2.250	3.375	1.224	1.14	7	49	343	2.645	1.91
$1\frac{5}{8}$	2.610	4.291	1.274	1.17	$7\frac{1}{4}$	52.562	381.078	2.692	1.93
$1\frac{3}{4}$	3.062	5.359	1.322	1.20	$7\frac{1}{2}$	56.250	421.875	2.738	1.95
$1\frac{7}{8}$	3.515	6.591	1.369	1.23	$7\frac{3}{4}$	60.062	465.484	2.783	1.97
2	4	8	1.414	1.26	8	64	512	2.828	2.
$2\frac{1}{8}$	4.515	9.595	1.457	1.28	$8\frac{1}{4}$	68.062	561.515	2.872	2.02
$2\frac{1}{4}$	5.062	11.390	1.500	1.30	$8\frac{1}{2}$	72.250	614.125	2.915	2.04
$2\frac{3}{8}$	5.640	13.396	1.541	1.33	$8\frac{3}{4}$	76.562	669.921	2.958	2.06
$2\frac{1}{2}$	6.250	15.625	1.581	1.35	9	81	729	3	2.08
$2\frac{5}{8}$	6.890	18.088	1.620	1.37	$9\frac{1}{4}$	85.562	791.453	3.041	2.09
$2\frac{3}{4}$	7.562	20.796	1.658	1.40	$9\frac{1}{2}$	90.25	857.375	3.082	2.11
$2\frac{7}{8}$	8.265	23.763	1.695	1.42	$9\frac{3}{4}$	95.062	926.859	3.122	2.13
3	9	27	1.732	1.44	10	100	1000	3.162	2.15
$3\frac{1}{8}$	9.765	30.517	1.767	1.46	$10\frac{1}{4}$	105.062	1076.89	3.201	2.17
$3\frac{1}{4}$	10.562	34.328	1.802	1.48	$10\frac{1}{2}$	110.250	1157.625	3.240	2.18
$3\frac{3}{8}$	11.390	38.443	1.837	1.50	$10\frac{3}{4}$	115.562	1242.296	3.278	2.20
$3\frac{1}{2}$	12.250	42.875	1.870	1.51	11	121	1331	3.316	2.22
$3\frac{5}{8}$	13.140	47.634	1.903	1.53	$11\frac{1}{4}$	126.562	1423.828	3.354	2.24
$3\frac{3}{4}$	14.062	52.734	1.936	1.55	$11\frac{1}{2}$	132.250	1520.875	3.391	2.25
$3\frac{7}{8}$	15.015	58.185	1.968	1.57	$11\frac{3}{4}$	138.062	1622.234	3.427	2.27
4	16	64	2	1.58	12	144	1728	3.464	2.29

TRIGONOMETRICAL RATIOS, ETC.

Angle		Chord	Sine	Tan- gent	Co- tan- gent	Co- sine			
Deg.	Rad.								
0°	0	0	0	0	∞	1	1.414	1.5708	90°
.5	.0087	.009	.0087	.0087	114.6	1	1.408	1.5621	89.5
1	.0175	.017	.0175	.0175	57.2900	.9998	1.402	1.5533	89
1.5	.0262	.025	.0262	.0262	38.19	.9997	1.396	1.5446	88.5
2	.0349	.035	.0349	.0349	28.6363	.9994	1.389	1.5359	88
2.5	.0436	.044	.0436	.0437	22.90	.9990	1.383	1.5272	87.5
3	.0524	.052	.0523	.0524	19.0811	.9986	1.377	1.5184	87
3.5	.0611	.061	.0610	.0612	16.35	.9981	1.370	1.5097	86.5
4	.0698	.070	.0698	.0699	14.3006	.9976	1.364	1.5010	86.
4.5	.0785	.079	.0785	.0787	12.71	.9969	1.358	1.4923	85.5
5	.0873	.087	.0872	.0875	11.4301	.9962	1.351	1.4835	85
5.5	.0960	.096	.0958	.0963	10.39	.9954	1.345	1.4748	84.5
6	.1047	.105	.1045	.1051	9.5144	.9945	1.338	1.4661	84
6.5	.1134	.113	.1132	.1139	8.7769	.9936	1.332	1.4573	83.5
7	.1222	.122	.1219	.1228	8.1443	.9925	1.325	1.4486	83
7.5	.1309	.131	.1305	.1317	7.5958	.9914	1.319	1.4399	82.5
8	.1396	.139	.1392	.1405	7.1154	.9903	1.312	1.4312	82
8.5	.1484	.148	.1478	.1495	6.6912	.9890	1.306	1.4224	81.5
9	.1571	.157	.1564	.1584	6.3138	.9877	1.299	1.4137	81
9.5	.1658	.166	.1650	.1673	5.9758	.9863	1.292	1.4050	80.5
10	.1745	.174	.1736	.1763	5.6713	.9848	1.286	1.3963	80
10.5	.1833	.183	.1822	.1853	5.3955	.9833	1.279	1.3875	79.5
11	.1920	.192	.1908	.1944	5.1446	.9816	1.272	1.3788	79
11.5	.2007	.200	.1994	.2035	4.9152	.9799	1.265	1.3701	78.5
12	.2094	.209	.2079	.2126	4.7046	.9781	1.259	1.3614	78
12.5	.2182	.218	.2164	.2217	4.5107	.9763	1.252	1.3526	77.5
13	.2269	.226	.2250	.2309	4.3315	.9744	1.245	1.3439	77
13.5	.2356	.235	.2334	.2401	4.1653	.9724	1.238	1.3352	76.5
14	.2443	.244	.2419	.2493	4.0108	.9703	1.231	1.3265	76
14.5	.2531	.252	.2504	.2586	3.8667	.9681	1.224	1.3177	75.5
15	.2618	.261	.2588	.2679	3.7321	.9659	1.217	1.3090	75
15.5	.2705	.270	.2672	.2773	3.6059	.9636	1.211	1.3003	74.5
16	.2793	.278	.2756	.2867	3.4874	.9613	1.204	1.2915	74
16.5	.2880	.287	.2840	.2962	3.3759	.9588	1.197	1.2828	73.5
17	.2967	.296	.2924	.3057	3.2709	.9563	1.190	1.2741	73
17.5	.3054	.304	.3007	.3153	3.1716	.9537	1.183	1.2654	72.5
18	.3142	.313	.3090	.3249	3.0777	.9511	1.176	1.2566	72
18.5	.3229	.322	.3173	.3346	2.9887	.9483	1.168	1.2479	71.5
19	.3316	.330	.3256	.3443	2.9042	.9455	1.161	1.2392	71
19.5	.3403	.339	.3338	.3541	2.8239	.9426	1.154	1.2305	70.5
20	.3491	.347	.3420	.3640	2.7475	.9397	1.147	1.2217	70
20.5	.3578	.356	.3502	.3739	2.6746	.9367	1.140	1.2130	69.5
21	.3665	.364	.3584	.3839	2.6051	.9336	1.133	1.2043	69
21.5	.3752	.373	.3665	.3939	2.5386	.9304	1.126	1.1956	68.5
22	.3840	.382	.3746	.4040	2.4751	.9272	1.118	1.1868	68
			Co- sine	Co- tan- gent	Tan- gent	Sine	Chord	Rad.	Deg.
									Angle

TRIGONOMETRICAL RATIOS, ETC.

Angle		Chord	Sine	Tangent	Co-tangent	Co-sine			
Deg.	Rad.								
22.5°	.3927	.390	.3827	.4142	2.4142	.9239	1.111	1.1781	67.5
23	.4014	.399	.3907	.4245	2.3559	.9205	1.104	1.1694	67
23.5	.4102	.407	.3987	.4348	2.2998	.9171	1.097	1.1606	66.5
24	.4189	.416	.4067	.4452	2.2460	.9135	1.089	1.1519	66
24.5	.4276	.424	.4147	.4557	2.1943	.9100	1.082	1.1432	65.5
25	.4363	.433	.4226	.4663	2.1445	.9063	1.075	1.1345	65
25.5	.4451	.441	.4305	.4770	2.0965	.9026	1.067	1.1257	64.5
26	.4538	.450	.4384	.4877	2.0503	.8988	1.060	1.1170	64
26.5	.4625	.458	.4462	.4986	2.0057	.8949	1.052	1.1083	63.5
27	.4712	.467	.4540	.5095	1.9626	.8910	1.045	1.0996	63
27.5	.4800	.475	.4617	.5206	1.9210	.8870	1.037	1.0908	62.5
28	.4887	.484	.4695	.5317	1.8807	.8829	1.030	1.0821	62
28.5	.4974	.492	.4772	.5430	1.8418	.8788	1.023	1.0734	61.5
29	.5061	.501	.4848	.5543	1.8040	.8746	1.015	1.0647	61
29.5	.5149	.509	.4924	.5658	1.7675	.8704	1.008	1.0559	60.5
30	.5236	.518	.5000	.5774	1.7321	.8660	1.000	1.0472	60
30.5	.5323	.526	.5075	.5890	1.6977	.8616	.993	1.0385	59.5
31	.5411	.534	.5150	.6009	1.6643	.8572	.985	1.0297	59
31.5	.5498	.543	.5225	.6128	1.6319	.8526	.977	1.0210	58.5
32	.5585	.551	.5299	.6249	1.6003	.8480	.970	1.0123	58
32.5	.5672	.560	.5373	.6371	1.5697	.8434	.962	1.0036	57.5
33	.5760	.568	.5446	.6494	1.5399	.8387	.954	.9948	57
33.5	.5847	.576	.5519	.6619	1.5108	.8339	.947	.9861	56.5
34	.5934	.585	.5592	.6745	1.4826	.8290	.939	.9774	56
34.5	.6021	.593	.5664	.6873	1.4550	.8241	.931	.9687	55.5
35	.6109	.601	.5736	.7002	1.4281	.8192	.923	.9599	55
35.5	.6196	.609	.5807	.7133	1.4019	.8141	.916	.9512	54.5
36	.6283	.618	.5878	.7265	1.3764	.8090	.908	.9425	54
36.5	.6370	.626	.5948	.7400	1.3514	.8039	.900	.9338	53.5
37	.6458	.635	.6018	.7536	1.3270	.7986	.892	.9250	53
37.5	.6545	.643	.6088	.7673	1.3032	.7934	.885	.9163	52.5
38	.6632	.651	.6157	.7813	1.2799	.7880	.877	.9076	52
38.5	.6720	.659	.6225	.7954	1.2572	.7826	.871	.8988	51.5
39	.6807	.668	.6293	.8098	1.2349	.7771	.861	.8901	51
39.5	.6894	.676	.6361	.8243	1.2131	.7716	.853	.8814	50.5
40	.6981	.684	.6428	.8391	1.1918	.7660	.845	.8727	50
40.5	.7069	.692	.6494	.8541	1.1708	.7604	.837	.8639	49.5
41	.7156	.700	.6561	.8693	1.1504	.7547	.829	.8552	49
41.5	.7243	.709	.6626	.8847	1.1308	.7490	.821	.8465	48.5
42	.7330	.717	.6691	.9004	1.1106	.7431	.813	.8378	48
42.5	.7418	.725	.6756	.9163	1.0913	.7373	.805	.8290	47.5
43	.7505	.733	.6820	.9325	1.0724	.7314	.796	.8203	47
43.5	.7592	.741	.6884	.9490	1.0538	.7254	.789	.8116	46.5
44	.7679	.749	.6947	.9657	1.0355	.7193	.781	.8029	46
44.5	.7767	.757	.7009	.9827	1.0176	.7133	.773	.7941	45.5
45	.7854	.765	.7071	1.0000	1.0000	.7071	.765	.7854	45
			Co-sine	Co-tangent	Tangent	Sine	Chord	Rad.	Deg.
								Angle	

Temperature Conversion Table

FAHRENHEIT — CENTIGRADE

°F.	°C.	°F.	°C.	°F.	°C.	°F.	°C.	°F.	°C.
—459.4	—273	66	18.9	110	43.3	154	67.8	198	92.2
—50	—45.6	67	19.4	111	43.9	155	68.3	199	92.8
—40	—40	68	20	112	44.4	156	68.9	200	93.3
—30	—34.4	69	20.6	113	45	157	69.4	201	93.9
—20	—28.9	70	21.1	114	45.6	158	70	202	94.4
—10	—23.3	71	21.7	115	46.1	159	70.6	203	95
0	—17.8	72	22.2	116	46.7	160	71.1	204	95.6
10	—12.2	73	22.8	117	47.2	161	71.7	205	96.1
20	— 6.7	74	23.3	118	47.8	162	72.2	206	96.7
30	— 1.1	75	23.9	119	48.3	163	72.8	207	97.2
32	0	76	24.4	120	48.9	164	73.3	208	97.8
33	0.6	77	25	121	49.4	165	73.9	209	98.3
34	1.1	78	25.6	122	50	166	74.4	210	98.9
35	1.7	79	26.1	123	50.6	167	75	211	99.4
36	2.2	80	26.7	124	51.1	168	75.6	212	100
37	2.8	81	27.2	125	51.7	169	76.1		
38	3.3	82	27.8	126	52.2	170	76.7		
39	3.9	83	28.3	127	52.8	171	77.2		
40	4.4	84	28.9	128	53.3	172	77.8		
41	5	85	29.4	129	53.9	173	78.3		
42	5.6	86	30	130	54.4	174	78.9		
43	6.1	87	30.6	131	55	175	79.4		
44	6.7	88	31.1	132	55.6	176	80		
45	7.2	89	31.7	133	56.1	177	80.6		
46	7.8	90	32.2	134	56.7	178	81.1		
47	8.3	91	32.8	135	57.2	179	81.7		
48	8.9	92	33.3	136	57.8	180	82.2		
49	9.4	93	33.9	137	58.3	181	82.8		
50	10	94	34.4	138	58.9	182	83.3		
51	10.6	95	35	139	59.4	183	83.9		
52	11.1	96	35.6	140	60	184	84.4		
53	11.7	97	36.1	141	60.6	185	85		
54	12.2	98	36.7	142	61.1	186	85.6		
55	12.8	99	37.2	143	61.7	187	86.1		
56	13.3	100	37.8	144	62.2	188	86.7		
57	13.9	101	38.3	145	62.8	189	87.2		
58	14.4	102	38.9	146	63.3	190	87.8		
59	15	103	39.4	147	63.9	191	88.3		
60	15.6	104	40	148	64.4	192	88.9		
61	16.1	105	40.6	149	65	193	89.4		
62	16.7	106	41.1	150	65.6	194	90		
63	17.2	107	41.7	151	66.1	195	90.6		
64	17.8	108	42.2	152	66.7	196	91.1		
65	18.3	109	42.8	153	67.2	197	91.7		

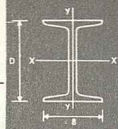
C. to F.
Multiply by 9, divide by 5, add 32.

F. to C.
Subtract 32, multiply by 5, divide by 9.

WEIGHTS OF STEEL PLATES

POUNDS PER LINEAL FOOT

Width Inches	Thickness in inches							
	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2
12	2.55	5.10	7.65	10.20	12.75	15.30	17.85	20.40
13	2.76	5.53	8.29	11.05	13.81	16.58	19.34	22.10
14	2.98	5.95	8.93	11.90	14.88	17.85	20.83	23.80
15	3.19	6.38	9.56	12.75	15.94	19.13	22.31	25.50
16	3.40	6.80	10.20	13.60	17.00	20.40	23.80	27.20
17	3.61	7.23	10.84	14.45	18.06	21.68	25.29	28.90
18	3.83	7.65	11.48	15.30	19.13	22.95	26.78	30.60
19	4.04	8.08	12.11	16.15	20.19	24.23	28.26	32.30
20	4.25	8.50	12.75	17.00	21.25	25.50	29.75	34.00
21	4.46	8.93	13.39	17.85	22.31	26.78	31.24	35.70
22	4.68	9.35	14.03	18.70	23.38	28.05	32.73	37.40
23	4.89	9.78	14.66	19.55	24.44	29.33	34.21	39.10
24	5.10	10.20	15.30	20.40	25.50	30.60	35.70	40.80
26	5.53	11.05	16.58	22.10	27.63	33.15	38.68	44.20
28	5.95	11.90	17.85	23.80	29.75	35.70	41.65	47.60
30	6.38	12.75	19.13	25.50	31.88	38.25	44.63	51.00
32	6.80	13.60	20.40	27.20	34.00	40.80	47.60	54.40
34	7.23	14.45	21.68	28.90	36.13	43.35	50.58	57.80
36	7.65	15.30	22.95	30.60	38.25	45.90	53.55	61.20
38	8.08	16.15	24.23	32.30	40.38	48.45	56.53	64.60
40	8.50	17.00	25.50	34.00	42.50	51.00	59.50	68.00
42	8.93	17.85	26.78	35.70	44.63	53.55	62.48	71.40
44	9.35	18.70	28.05	37.40	46.75	56.10	65.45	74.80
46	9.78	19.55	29.33	39.10	48.88	58.65	68.43	78.20
48	10.20	20.40	30.60	40.80	51.00	61.20	71.40	81.60
50	10.6	21.3	31.9	42.5	53.1	63.8	74.40	85.0
52	11.1	22.1	33.2	44.2	55.3	66.3	77.4	88.4
54	11.5	23.0	34.4	45.9	57.4	68.9	80.3	91.8
56	11.9	23.8	35.7	47.6	59.5	71.4	83.3	95.2
58	12.3	24.7	37.0	49.3	61.6	74.0	86.3	98.6
60	12.8	25.5	38.3	51.0	63.8	76.5	89.3	102.0
62	13.2	26.4	39.5	52.7	65.9	79.1	92.2	105.4
64	13.6	27.2	40.8	54.4	68.0	81.6	95.2	108.8
66	14.0	28.1	42.1	56.1	70.1	84.2	98.2	112.2
68	14.5	28.9	43.4	57.8	72.3	86.7	101.2	115.6
70	14.9	29.8	44.6	59.5	74.4	89.3	104.1	119.0
72	15.3	30.6	45.9	61.2	76.5	91.8	107.1	122.4
74	15.7	31.5	47.2	62.9	78.6	94.4	110.1	125.8
76	16.2	32.3	48.5	64.6	80.8	96.9	113.1	129.2
78	16.6	33.2	49.7	66.3	82.9	99.5	116.0	132.6
80	17.0	34.0	51.0	68.0	85.0	102.0	119.0	136.0
82	17.4	34.9	52.3	69.7	87.1	104.6	122.0	139.4
84	17.9	35.7	53.6	71.4	89.3	107.1	125.0	142.8



Properties of Australian "I" Beams

Reference Marks	Size ins. D x B	Wgt. per ft.	Sect. Area sq. in.	Moment of Inertia		Modulus of Section	
				About XX	About YY	About XX	About YY
ASB126	*24 x 7½	100	29.4	2581	63.55	215.1	16.68
	24 x 7½	95	27.9	2533	62.54	211.1	16.68
	24 x 7½	90	26.5	2443	60.44	203.6	16.12
ASB125	22 x 7	75	22.1	1677	41.07	152.4	11.73
ASB124	20 x 6½	65	19.1	1226	32.56	122.6	10.02
ASB123	18 x 6	55	16.2	842	23.64	93.5	7.88
	†16 x 8	75	22.1	973	68.30	121.7	17.08
ASB121	16 x 6	50	14.7	618	22.47	77.3	7.49
ASB120	15 x 6	45	13.2	492	19.87	65.6	6.62
ASB119	14 x 5½	40	11.8	377	14.79	53.9	5.38
ASB118	13 x 5	35	10.3	283	10.82	43.6	4.33
ASB117	12 x 8	65	19.1	488	65.18	81.3	16.30
ASB116	12 x 5	30	8.8	207	8.77	34.5	3.51
ASB115	10 x 8	70	20.6	345	71.61	69.0	17.90
ASB114	10 x 8	55	16.2	289	54.74	57.7	13.69
ASB113	10 x 6	40	11.8	205	21.76	41.0	7.25
ASB112	10 x 4½	25	7.4	122	6.49	24.5	2.88
ASB111	9 x 7	50	14.7	208	40.17	46.3	11.48
ASB110	9 x 4	21	6.2	81	4.15	18.0	2.07
ASB109	8 x 6	35	10.3	115	19.54	28.8	6.51
ASB108	8 x 4	18	5.30	55.6	3.506	13.91	1.753
ASB107	7 x 3½	15	4.42	35.9	2.408	10.26	1.376
ASB106	6 x 5	25	7.35	45.2	9.876	15.05	3.951
ASB105	6 x 3	12	3.53	20.99	1.461	7.00	.974
ASB104	5 x 2½	9	2.65	10.91	.789	4.36	.631
ASB103	4 x 3	10	2.94	7.79	1.326	3.89	.884
ASB102	4 x 1¾	5	1.47	3.66	.186	1.80	.210
	3 x 2½	5.7	1.69	2.55	.418	1.70	.358

* Nominal size, width about 7⅝ in.

† Not at present available.

Allowable Stresses in Steel

Material	Tensile	Bending	Shearing	Bearing
Rolled sections	20,200	22,400	14,600	26,900
Shop rivets	11,200	—	13,400	26,900
Field rivets	9,000	—	11,200	22,400
Fitted bolts	11,200 (min.)	—	13,400	26,900
Black bolts	11,200 (min.)	—	9,000	17,900
Cast steel	20,200	22,400	14,600	26,900
Cast iron	2,500	3,000	1,500	12,000

Lysaght Steel Sheets	Sunstar	Deep Drawing	C30	C60, C80
Ultimate Tensile tons/sq. in.	20-25	20-22	30-40	50-60
Yield point	14-18	12-14	20-28	30-40
% Elongation on 2 inches ..	20-25	36-44	10-15	10-15

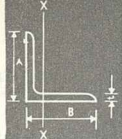
ROLLED STEEL "I" BEAMS AS GIRDERS

SAFE DISTRIBUTED LOAD IN TONS, ABOUT AXIS XX

JOHN LYSAGHT (Australia) LIMITED

Size Inches	Weight per ft. lb	SPAN IN FEET																	Size Inches
		4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	36	40	
24 x 7½	100		205.0	178.5	142.5	119.0	102.0	89.2	79.2	71.4	64.8	59.5	54.8	51.0	47.5	44.6	39.7	35.7	24 x 7½
24 x 7½	95		182.0	175.0	140.0	117.0	100.0	87.6	78.0	70.2	63.3	58.5	54.0	50.2	46.8	43.9	39.1	35.1	24 x 7½
24 x 7½	90			166.3	135.3	112.6	96.4	84.4	75.0	67.4	61.5	56.2	51.9	48.1	45.0	42.2	37.4	33.7	24 x 7½
22 x 7	75		147.0	127.0	101.6	84.6	72.5	63.4	56.4	50.8	46.2	42.3	39.1	36.3	33.8	31.7	28.2	25.4	22 x 7
20 x 6½	65		120.0	101.8	81.4	67.8	58.1	50.8	45.1	41.7	37.0	33.8	31.2	29.0	27.1	25.4	22.6	20.3	20 x 6½
18 x 6	55		101.0	77.6	62.0	51.8	44.3	38.8	34.3	31.0	28.2	25.9	23.9	22.1	20.6	19.4	17.2	15.4	18 x 6
16 x 8	75		102.4	101.1	81.0	67.4	57.8	50.5	44.9	40.4	36.8	33.5	31.1	28.9	27.0	25.2	22.5	20.3	16 x 8
16 x 6	50		85.4	64.0	51.2	42.6	36.6	32.0	28.4	25.6	23.3	21.4	19.6	18.3	17.1	16.1	14.2	12.8	16 x 6
15 x 6	45		72.5	54.4	43.5	36.2	31.1	27.1	24.1	21.6	19.9	18.1	16.7	15.6	14.4	13.5	12.1	10.8	15 x 6
14 x 5½	40	69.1	59.3	44.6	35.6	29.7	25.5	22.3	19.8	17.8	16.2	14.8	13.7	12.7	11.8	11.1	9.8	8.8	14 x 5½
13 x 5	35	60.6	48.1	36.2	29.0	24.0	20.6	18.0	16.1	14.4	13.1	12.0	11.1	10.3	9.7	9.0	8.0	7.2	13 x 5
12 x 8	65		68.6	67.4	54.0	44.9	38.4	33.7	30.0	27.0	24.5	22.5	20.8	19.3	18.1	16.8	14.9	13.6	12 x 8
12 x 5	30	52.7	38.1	28.5	22.9	19.1	16.3	14.3	12.7	11.5	10.3	9.6	8.8	8.1	7.6	7.1	6.3	5.7	12 x 5
10 x 8	70	79.9	76.5	57.5	45.9	38.3	32.8	28.7	25.5	23.0	20.9	19.2	17.7	16.4	15.3	14.3			10 x 8
10 x 8	55		53.2	47.9	38.3	31.8	27.2	23.9	21.3	19.2	17.4	15.9	14.7	13.6	12.7	11.9			10 x 8
10 x 6	40	48.0	45.4	34.1	27.2	22.8	19.4	17.1	15.2	13.6	12.4	11.3	10.4	9.7	9.1	8.6			10 x 6
10 x 4½	25	40.4	27.0	20.3	16.2	13.6	11.6	10.1	9.0	8.1	7.5	6.7	6.2	5.7	5.4	5.1			10 x 4½
9 x 7	50		48.0	38.4	30.7	25.6	21.9	19.2	17.1	15.5	13.9	12.8	11.8	10.9	10.2				9 x 7
9 x 4	21	29.9	19.9	14.9	12.0	10.0	8.5	7.5	6.6	6.0	5.4	5.0	4.6	4.2					9 x 4
8 x 6	35	37.3	31.7	23.9	19.0	15.9	13.6	12.0	10.6	9.6	8.6	8.0	7.3	6.8					8 x 6
8 x 4	18	23.0	15.4	11.6	9.2	7.7	6.6	5.7	5.1	4.6	4.2	3.9	3.5	3.2					8 x 4
7 x 3½	15	17.1	11.3	8.5	6.8	5.7	4.9	4.2	3.7	3.4	3.1	2.9	2.6						7 x 3½
6 x 5	25	24.9	16.7	12.4	10.0	8.4	7.1	6.1	5.6	5.0	4.5								6 x 5
6 x 3	12	11.6	7.7	5.9	4.6	3.9	3.4	2.9	2.6	2.4									6 x 3
5 x 2½	9	7.2	4.9	3.6	2.9	2.4	2.0	1.7											5 x 2½
4 x 3	10	6.5	4.4	3.2	2.6	2.1	1.9	1.6											4 x 3
4 x 1¾	5	3.0	2.0	1.5	1.2	1.0	.9	.7											4 x 1¾

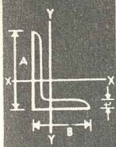
Equal Angles Properties



The tabulated values of section moduli for single angles, when used for the determination of bending stresses in angles, apply only to sections consisting of two angles back to back or toe to toe, for which twice the tabulated values are the section moduli.

Reference Number	Size A x B x t inches	Weight per lb. ft.	Sect. Area sq. in.	M. of I. about X X	Min. mod. of Sect. about X X	Reference Number	Size A x B x t inches	Weight per lb. ft.	Sect. Area sq. in.	M. of I. about X X	Min. mod. of Sect. about X X
ASEA 143	8 x 8 x 5/8	32.68	9.61	58.26	10.05	ASEA 121	2 1/2 x 2 1/2 x 3/16	3.10	0.92	0.53	0.29
" 144	8 x 8 x 3/4	38.89	11.44	68.58	11.94	" 122	2 1/2 x 2 1/2 x 1/4	4.04	1.19	0.68	0.38
" 145	8 x 8 x 7/8	45.00	13.24	78.44	13.77	" 123	2 1/2 x 2 1/2 x 5/16	4.98	1.46	0.83	0.47
" 146	8 x 8 x 1	51.01	15.00	87.85	15.55	" 124	2 1/2 x 2 1/2 x 3/8	5.90	1.73	0.96	0.55
ASEA 139	6 x 6 x 3/8	14.82	4.36	14.95	3.40	" 125	2 1/2 x 2 1/2 x 1/2	7.65	2.25	1.21	0.71
BSEA 113	6 x 6 x 7/16	17.19	5.05	17.22	3.95	ASEA 117	2 1/2 x 2 1/2 x 3/16	2.77	0.81	0.39	0.23
ASEA 140	6 x 6 x 1/2	19.55	5.75	19.48	4.49	" 118	2 1/2 x 2 1/2 x 1/4	3.61	1.06	0.49	0.30
BSEA 113	6 x 6 x 9/16	21.86	6.43	21.60	5.01	" 119	2 1/2 x 2 1/2 x 5/16	4.45	1.31	0.59	0.37
ASEA 141	6 x 6 x 5/8	24.17	7.11	23.73	5.54	" 120	2 1/2 x 2 1/2 x 3/8	5.26	1.55	0.69	0.44
ASEA 142	6 x 6 x 3/4	28.89	8.44	27.74	6.54						
BSEA 113	6 x 6 x 7/8	33.04	9.72	31.40	7.50	ASEA 113	2 x 2 x 1/8	1.67	0.49	0.18	0.12
	6 x 6 x 1	37.40	11.00	35.06	8.45	" 114	2 x 2 x 3/16	2.43	0.72	0.26	0.18
ASEA 135	5 x 5 x 5/16	10.30	3.03	7.20	1.97	" 115	2 x 2 x 1/4	3.19	0.94	0.34	0.24
" 136	5 x 5 x 3/8	12.28	3.61	8.53	2.35	" 116	2 x 2 x 5/16	3.92	1.15	0.41	0.29
" 137	5 x 5 x 1/2	16.16	4.75	11.04	3.08		2 x 2 x 3/8	4.62	1.36	0.47	0.34
" 138	5 x 5 x 5/8	19.93	5.86	13.37	3.78						
BSEA 110	5 x 5 x 3/4	23.59	6.94	15.54	4.46	ASEA 110	1 1/2 x 1 1/2 x 1/8	1.46	0.43	0.12	0.09
ASEA 132	4 x 4 x 5/16	8.17	2.40	3.61	1.24	" 111	1 1/2 x 1 1/2 x 3/16	2.11	0.62	0.17	0.14
" 133	4 x 4 x 3/8	9.72	2.86	4.26	1.48	" 112	1 1/2 x 1 1/2 x 1/4	2.76	0.81	0.22	0.18
" 134	4 x 4 x 1/2	12.75	3.75	5.46	1.93	" 113	1 1/2 x 1 1/2 x 5/16	3.39	1.00	0.26	0.22
BSEA 110	4 x 4 x 5/8	15.67	4.61	6.56	2.36	" 114	1 1/2 x 1 1/2 x 3/8	4.02	1.18	0.31	0.26
ASEA 109	3 x 3 x 1/4	5.74	1.70	1.96	0.76						
ASEA 129	3 x 3 x 5/16	7.11	2.09	2.38	0.94	ASEA 107	1 1/2 x 1 1/2 x 1/8	1.23	0.36	0.07	0.07
" 130	3 x 3 x 3/8	8.45	2.48	2.80	1.12	" 108	1 1/2 x 1 1/2 x 3/16	1.79	0.53	0.11	0.10
" 131	3 x 3 x 1/2	11.05	3.25	3.57	1.46	" 109	1 1/2 x 1 1/2 x 1/4	2.34	0.69	0.13	0.13
BSEA 109	3 x 3 x 5/8	13.55	3.98	4.27	1.77	" 110	1 1/2 x 1 1/2 x 5/16	2.85	0.84	0.16	0.16
						ASEA 104	1 1/2 x 1 1/2 x 1/8	1.02	0.30	0.04	0.05
						" 105	1 1/2 x 1 1/2 x 3/16	1.48	0.43	0.06	0.07
						" 106	1 1/2 x 1 1/2 x 1/4	1.91	0.56	0.07	0.09
						" 107	1 1/2 x 1 1/2 x 5/16	2.34	0.69	0.09	0.11
ASEA 125	3 x 3 x 1/4	4.89	1.44	0.93	0.42	ASEA 101	1 x 1 x 1/8	0.80	0.23	0.02	0.03
" 126	3 x 3 x 5/16	6.05	1.78	1.47	0.88	" 102	1 x 1 x 3/16	1.15	0.34	0.03	0.04
" 127	3 x 3 x 3/8	7.17	2.11	1.72	0.81	" 103	1 x 1 x 1/4	1.49	0.44	0.04	0.05
" 128	3 x 3 x 1/2	9.35	2.75	2.18	1.05						
	3 x 3 x 5/8	11.42	3.36	2.59	1.27						

The tabulated values of section moduli for single angles, when used for the determination of bending stresses in angles, apply only to sections consisting of two angles back to back or toe to toe, for which twice the tabulated values are the section moduli.



JOHN LYSAGHT (Australia) LIMITED

Unequal Angles Properties

Reference Number	Size A x B x t inches	Wgt. per ft. lb.	Sect. Area inches	Min. mod. of Section		Reference Number	Size A x B x t inches	Wgt. per ft. lb.	Sect. Area inches	Min. mod. of Section	
				Abt. XX	Abt. YY					Abt. XX	Abt. YY
ASUA 124	6 x 4 x 3/8	13.54	3.98	3.82	1.95	BSUA 109	4 x 3 x 1/4	5.75	1.69	0.98	0.58
" 125	6 x 4 x 1/2	17.84	5.25	5.03	2.56	ASUA 114	4 x 3 x 5/16	7.11	2.09	1.20	0.71
" 126	6 x 4 x 5/8	22.04	6.48	6.21	3.16	BSUA 109	4 x 3 x 3/8	8.45	2.48	1.42	0.84
" 127	6 x 4 x 3/4	26.13	7.69	7.33	3.72	ASUA 115	4 x 3 x 7/16	9.83	2.89	1.63	0.96
ASUA 124	6 x 4 x 3/8	12.28	3.61	3.23	1.54	ASUA 111	4 x 3 x 1/2	11.05	3.25	1.85	1.09
" 125	6 x 4 x 1/2	16.16	4.75	4.25	2.02	BSUA 107	4 x 3 x 5/8	13.55	3.98	2.26	1.33
" 126	6 x 4 x 5/8	19.93	5.86	5.23	2.48	ASUA 111	3 x 3 x 1/4	5.32	1.56	0.74	0.56
" 127	6 x 4 x 3/4	23.59	6.94	6.16	2.91	BSUA 107	3 x 3 x 5/16	6.58	1.93	0.92	0.69
6 x 4 x 7/8	27.10	7.98	7.10	3.38	3.86	ASUA 112	3 x 3 x 3/8	7.81	2.30	1.10	0.83
6 x 4 x 1	30.60	9.00	8.03	3.86	4.40	" 113	3 x 3 x 1/2	10.20	3.00	1.42	1.07
BSUA 116	6 x 3 x 5/16	9.32	2.74	2.65	1.00	ASUA 110	3 x 3 x 5/8	12.49	3.67	1.73	1.30
ASUA 121	6 x 3 x 3/8	11.63	3.42	3.16	1.18	ASUA 109	3 x 2 x 3/16	3.74	1.10	0.56	0.30
BSUA 116	6 x 3 x 7/16	13.54	3.99	3.65	1.36	BSUA 106	3 x 2 x 1/4	4.89	1.44	0.73	0.39
ASUA 122	6 x 3 x 1/2	15.30	4.50	4.15	1.54	ASUA 110	3 x 2 x 5/16	6.05	1.78	0.90	0.49
" 123	6 x 3 x 5/8	18.86	5.55	5.11	1.89	ASUA 107	3 x 2 x 3/8	7.17	2.11	1.07	0.58
6 x 3 x 3/4	22.31	6.56	6.02	2.22	2.66	ASUA 108	3 x 2 x 1/2	9.35	2.75	1.39	0.73
6 x 3 x 3/8	11.00	3.24	3.07	3.07	0.87	ASUA 105	3 x 2 x 3/16	3.40	1.00	0.42	0.30
6 x 3 x 1/2	14.45	4.25	4.06	4.06	1.14	BSUA 105	3 x 2 x 1/4	4.46	1.31	0.54	0.39
6 x 3 x 5/8	17.80	5.24	5.02	5.02	1.41	ASUA 106	3 x 2 x 5/16	5.51	1.62	0.67	0.48
6 x 3 x 3/4	21.05	6.19	5.90	5.90	1.66	ASUA 104	3 x 2 x 3/8	6.54	1.92	0.79	0.56
5 x 4 x 5/16	9.15	2.69	1.92	1.92	0.87	ASUA 104	3 x 2 x 1/2	8.50	2.50	1.02	0.72
5 x 4 x 3/8	11.00	3.24	2.28	2.28	1.52	BSUA 104	3 x 2 x 3/16	3.03	0.90	0.41	0.19
5 x 4 x 1/2	14.45	4.25	2.99	2.99	1.98	ASUA 105	3 x 2 x 1/4	4.04	1.19	0.52	0.25
5 x 4 x 5/8	17.80	5.24	3.67	3.67	2.43	BSUA 104	3 x 2 x 5/16	4.93	1.47	0.65	0.30
5 x 4 x 3/4	21.05	6.19	4.35	4.35	2.88	ASUA 106	3 x 2 x 3/8	5.90	1.74	0.76	0.36
5 x 3 x 1/4	6.60	1.94	1.48	1.48	0.59	ASUA 104	3 x 2 x 1/2	7.65	2.25	0.99	0.46
5 x 3 x 5/16	8.17	2.40	1.83	1.83	0.72	ASUA 101	2 x 2 x 3/16	2.75	0.81	0.29	0.19
5 x 3 x 3/8	9.72	2.86	2.18	2.18	0.85	ASUA 102	2 x 2 x 1/4	3.61	1.06	0.37	0.24
5 x 3 x 7/16	11.30	3.33	2.52	2.52	0.98	ASUA 103	2 x 2 x 5/16	4.45	1.31	0.46	0.30
5 x 3 x 1/2	12.75	3.75	2.86	2.86	1.11	ASUA 104	2 x 2 x 3/8	5.26	1.55	0.54	0.35
5 x 3 x 5/8	15.67	4.61	3.50	3.50	1.36						

WEIGHTS AND AREAS OF SQUARE AND ROUND STEEL BARS

Thickness or diam. in inches	Weight in lb. of Square bar one foot long	Weight in lb. of Round bar one foot long	Area of Square Bar in inches	Area of Round Bar in inches	Circumference of Round Bar in inches
3/16	.120	.094	.0352	.0276	.5891
1/4	.212	.167	.0625	.0491	.7854
5/16	.332	.261	.0977	.0767	.9818
3/8	.478	.376	.1406	.1104	1.1781
7/16	.651	.511	.1914	.1503	1.3745
1/2	.850	.668	.2500	.1963	1.5708
9/16	1.076	.945	.3164	.2485	1.7672
5/8	1.328	1.043	.3906	.3068	1.9635
11/16	1.607	1.262	.4727	.3712	2.1599
3/4	1.913	1.502	.5625	.4418	2.3562
13/16	2.245	1.763	.6602	.5185	2.5526
7/8	2.603	2.044	.7656	.6013	2.7489
15/16	2.988	2.347	.8789	.6903	2.9453
1	3.400	2.670	1.0000	.7854	3.1416
1 1/8	4.303	3.380	1.2656	.9940	3.5343
1 1/4	5.313	4.172	1.5625	1.2272	3.9270
1 1/2	6.428	5.049	1.8906	1.4849	4.3197
1 3/4	7.650	6.008	2.2500	1.7671	4.7124
2	8.978	7.051	2.6406	2.0739	5.1051
2 1/8	10.41	8.178	3.0625	2.4053	5.4978
2 1/4	11.95	9.388	3.5156	2.7612	5.8905
2 1/2	13.60	10.68	4.0000	3.1416	6.2832
2 3/4	15.35	12.06	4.5156	3.5466	6.6759
3	17.21	13.52	5.0625	3.9761	7.0686
3 1/8	19.18	15.06	5.6406	4.4301	7.4613
3 1/4	21.25	16.69	6.2500	4.9087	7.8540
3 1/2	23.43	18.40	6.8906	5.4119	8.2467
3 3/4	25.71	20.19	7.5625	5.9396	8.6394
4	28.10	22.07	8.2656	6.4918	9.0321
4 1/8	30.60	24.03	9.0000	7.0686	9.4248
4 1/4	35.92	28.21	10.563	8.2958	10.210
4 1/2	41.65	32.71	12.250	9.6211	10.996
4 3/4	47.82	37.55	14.063	11.045	11.781
5	54.40	42.73	16.000	12.566	12.566
5 1/8	61.41	48.24	18.063	14.186	13.352
5 1/4	68.85	54.07	20.250	15.904	14.137
5 1/2	76.71	60.25	22.563	17.721	14.923
5 3/4	85.00	66.76	25.000	19.635	15.708
6	102.9	80.78	30.250	23.758	17.279
6 1/2	122.4	96.13	36.000	28.274	18.850

One cubic foot of steel weighs 489.6 lb.

Areas and Circumferences of Circles in Inches

Dia. in ins.	Areas				Dia. in ins.	Circumferences			
	0 in.	$\frac{1}{4}$ in.	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.		0 in.	$\frac{1}{4}$ in.	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.
0	.0	.0490	.1963	.4417	0	.0	.7854	1.570	2.356
1	.7854	1.227	1.767	2.405	1	3.141	3.927	4.712	5.497
2	3.141	3.976	4.908	5.939	2	6.283	7.063	7.854	8.639
3	7.068	8.295	9.621	11.04	3	9.424	10.21	10.99	11.78
4	12.56	14.18	15.90	17.72	4	12.56	13.35	14.13	14.92
5	19.63	21.64	23.76	25.96	5	15.70	16.49	17.27	18.06
6	28.27	30.68	33.18	35.78	6	18.84	19.63	20.42	21.20
7	38.48	41.28	44.18	47.17	7	21.99	22.77	23.56	24.34
8	50.26	53.45	56.74	60.13	8	25.13	25.91	26.70	27.48
9	63.61	67.20	70.88	74.66	9	28.27	29.05	29.84	30.63
10	78.54	82.51	86.59	90.76	10	31.41	32.20	32.98	33.77
11	95.03	99.40	103.8	108.4	11	34.55	35.34	36.12	36.91
12	113.1	117.8	122.7	127.6	12	37.69	38.48	39.27	40.05
13	132.7	137.8	143.1	148.4	13	40.84	41.62	42.41	43.19
14	153.0	159.4	165.1	170.8	14	43.98	44.76	45.55	46.33
15	176.7	182.6	188.6	194.8	15	47.12	47.90	48.69	49.48
16	201.0	207.3	213.8	220.3	16	50.26	51.05	51.83	52.62
17	226.9	233.7	240.5	247.4	17	53.40	54.19	54.97	55.76
18	254.4	261.5	268.8	276.1	18	56.54	57.33	58.11	58.90
19	283.5	291.0	298.6	306.3	19	59.69	60.47	61.26	62.04
20	314.1	322.0	330.0	338.1	20	62.83	63.61	64.40	65.18
21	346.3	354.6	363.0	371.5	21	65.97	66.75	67.54	68.32
22	380.1	388.8	397.6	406.4	22	69.11	69.90	70.68	71.47
23	415.4	424.5	433.7	443.0	23	72.25	73.04	73.82	74.61
24	452.3	461.8	471.4	481.1	24	75.39	76.18	76.96	77.75
25	490.8	500.7	510.7	520.7	25	78.54	79.32	80.11	80.89
26	530.9	541.1	551.5	562.0	26	81.68	82.46	83.25	84.03
27	572.5	583.2	593.9	604.8	27	84.82	85.60	86.39	87.17
28	615.7	626.8	637.9	649.1	28	87.96	88.75	89.53	90.32
29	660.5	671.9	683.3	695.1	29	91.10	91.89	92.67	93.46
30	706.8	718.6	730.6	742.6	30	94.24	95.03	95.81	96.60
31	754.8	767.0	779.3	791.7	31	97.40	98.20	98.99	99.79
32	804.2	816.9	829.6	842.4	32	100.5	101.3	102.1	102.9
33	855.3	868.3	881.4	894.6	33	103.7	104.5	105.2	106.0
34	908.0	921.3	934.8	948.4	34	106.8	107.6	108.4	109.2
35	962.1	975.9	989.8	1003.8	35	110.0	110.7	111.5	112.3
36	1017.9	1032.1	1046.4	1060.7	36	113.1	113.8	114.6	115.5
37	1075.2	1089.8	1104.5	1119.2	37	116.2	117.0	117.8	118.6
38	1134.1	1149.3	1164.2	1179.3	38	119.4	120.2	121.0	121.7
39	1194.6	1210.0	1225.4	1241.0	39	122.5	123.3	124.1	124.8
40	1256.6	1272.4	1288.3	1304.2	40	125.7	126.4	127.2	128.0

WEIGHTS OF FLAT ROLLED STEEL

POUNDS PER LINEAL FOOT

Width inches	Thickness in Inches											
	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4
1	.053 .106 .159 .213	.106 .213 .319 .425	.159 .319 .478 .638	.213 .425 .638 .850	.27 .53 .80 1.06	.32 .64 .96 1.28	.37 .74 1.12 1.49	.43 .85 1.28 1.70	.48 .96 1.43 1.91	.53 1.06 1.59 2.13	.58 1.17 1.75 2.34	.64 1.28 1.91 2.55
2	.266 .319 .372 .425	.531 .638 .744 .850	.797 .956 1.116 1.275	1.063 1.275 1.488 1.700	1.33 1.59 1.86 2.13	1.59 1.91 2.23 2.55	1.86 2.23 2.60 2.98	2.13 2.55 2.98 3.40	2.39 2.87 3.35 3.83	2.66 3.19 3.72 4.25	2.92 3.51 4.09 4.68	3.19 3.83 4.46 5.10
3	.478 .531 .584 .638	.956 1.063 1.169 1.275	1.434 1.594 1.753 1.913	1.913 2.125 2.338 2.550	2.39 2.66 2.92 3.19	2.87 3.19 3.51 3.83	3.35 3.72 4.09 4.46	3.83 4.25 4.68 5.10	4.30 4.78 5.26 5.74	4.78 5.31 5.84 6.38	5.26 5.84 6.43 7.01	5.74 6.38 7.01 7.65
4	.691 .744 .797 .850	1.381 1.488 1.594 1.700	2.072 2.231 2.391 2.550	2.763 2.975 3.188 3.400	3.45 3.72 3.98 4.25	4.14 4.46 4.78 5.10	4.83 5.21 5.58 5.95	5.53 5.95 6.38 6.80	6.22 6.69 7.17 7.65	6.69 7.17 7.65 8.11	7.17 7.65 8.11 8.58	7.65 8.11 8.58 9.05
5	.903 .956 1.009 1.063	1.806 1.913 2.019 2.125	2.709 2.869 3.028 3.188	3.613 3.825 4.038 4.250	4.52 4.78 5.05 5.31	5.42 5.74 6.06 6.38	6.32 6.69 7.07 7.44	7.23 7.65 8.08 8.50	8.13 8.61 9.08 9.56	9.03 9.56 10.09 10.63	9.93 10.52 11.10 11.69	10.84 11.48 12.11 12.75
6	1.116 1.169 1.222 1.275	2.231 2.338 2.444 2.550	3.347 3.506 3.666 3.825	4.463 4.675 4.888 5.100	5.58 5.84 6.11 6.38	6.69 7.01 7.33 7.65	7.81 8.18 8.55 8.93	8.93 9.35 9.78 10.20	10.04 10.52 11.00 11.48	11.16 11.69 12.22 12.75	12.27 12.86 13.44 14.03	13.39 14.03 14.66 15.30

WEIGHTS OF STEEL WIRE

Diam. inches (app.)	Size I.S.W.G.	Decimal of an inch	Milli- metres	Sectional area in sq. in.	Appr. wt. in lb.	
					100 yds.	Mile
1/2	7/0	.500	12.7	.19635	200.11	3.522
15/32	6/0	.464	11.8	.16910	172.33	3.033
7/16	5/0	.432	11.0	.14657	149.37	2.629
13/32	4/0	.400	10.2	.12568	128.07	2.254
3/8	3/0	.372	9.4	.10869	110.80	1.950
11/32	2/0	.358	8.8	.09510	96.93	1.706
	1/0	.324	8.2	.18244	84.03	1.479
	1	.300	7.6	.07069	72.04	1.263
	2	.276	7.0	.05982	60.97	1.073
1/4	3	.252	6.4	.14987	50.85	805
	4	.232	5.9	.04227	43.07	753
	5	.212	5.4	.03530	35.97	633
3/16	6	.192	4.9	.02896	29.43	518
	7	.176	4.5	.02432	24.77	436
	8	.160	4.1	.02011	20.45	360
	9	.144	3.7	.01628	16.59	292
1/8	10	.128	3.3	.10287	13.12	231
	11	.616	3.0	.01057	10.80	190
	12	.104	2.6	.00850	8.63	152
3/32	13	.092	2.3	.00665	6.76	119
	14	.080	2.0	.00503	5.11	90
	15	.072	1.8	.00407	4.15	73
1/16	16	.064	1.6	.00322	3.29	58
	17	.056	1.4	.00246	2.50	44
3/64	18	.048	1.2	.00181	1.83	32.5
	19	.040	1.0	.00126	1.27	22.54
	20	.036	0.9	.00102	1.03	18.00
1/32	21	.032	0.8	.00080	0.819	14.42
	22	.028	0.7	.00062	0.628	11.04
	23	.024	0.6	.00045	0.461	8.11
3/128	24	.022	0.55	.00038	0.387	6.82
	25	.020	0.5	.00031	0.320	5.63
	26	.018	0.45	.00025	0.259	4.56
	27	.0164	0.4	.00021	0.215	3.79

STRENGTH OF STEEL WIRE ROPES

Commercial ropes are made in the following qualities, breaking strains being quoted as percentage of the 100-110-ton rope list.

Black Best Patent (80/90 tons sq. in.)	80%
Galvanized Hawser (80/95 tons sq. in.)	85%
Black Special Patent (90/100 tons sq. in.)	90%
Special Plough (110/120 tons sq. in.)	110%

Other special qualities are available in both black and galvanized wire for mining, aircraft work, etc. When ropes are fitted with an independent wire rope core (I.W.R.C.), add 10% to the weight of rope shown and 7½% to the list breaking strains.

FACTORS OF SAFETY

Cranes (Hook Hoist, Grab Hoist, Derrick Fall, and Boom Lines)	6
Service Winch or Block Ropes	6
Shovels and Excavating Equipment	5 to 6 min.
Derrick Crane Guys	5
Logging Skylines, Main Cableways	4
Logging Spar Tree Guys and Stack Guys	3 to 4 min.
Incline Haulages	6 to 8 min.

ORDERING OF WIRE ROPES

When in doubt, the following rope characteristics should be provided to the ropemaker, accompanied, if possible, by a simple line sketch of the rope rigging, showing the size of sheaves, drums, and type of attachments.

Description of Rope	Example
1. Dimensions:	
(a) Length	3,000 ft.
(b) Circumference or diameter	3½" circ.
2. Construction:	
Number of strands	6
Number of wires per strand	x 19
Arrangement of wires in each strand	9/9/1
Lay: Direction and type	R.H.O.L.
Core: Steel or hemp	Hemp
Kind of fabrication	Preformed
3. Grade:	
Quality of steel (acid or basic)	Basic
Tensile strength of wire	Best Plough or 100/110 t.s.i.
4. Lubrication:	
Petroleum jelly, graphite, etc.	Graphite
5. Service:	
Type of equipment on which rope is to be used	Caterpillar Logging Winch

POINTS IN ROPE USAGE

1. Where conditions are very abrasive, use the coarsest rope construction compatible with reasonable flexibility over the sheaves and drums used, and in plough steel or special plough steel wire. Such ropes should be preformed.
2. Where the rope can be anchored at both ends to prevent rotation of the load, Langs Laid ropes are more capable of withstanding increased wear and bending life than Ordinary Lay ropes. These ropes also should be preformed.
3. Use ropes fitted with an I.W.R.C. when they are subjected to heavy loading over small sheaves and drums.
4. When working conditions are corrosive or are not conducive to ready and regular maintenance, use galvanized wire ropes.
5. Always seize ropes before cutting.
6. To obtain maximum life from ropes they should be kept well lubricated from the time they are installed.

SHEAVES AND DRUMS

Small sheaves and drums with bad-fitting grooves are responsible for considerable rope abuse, and care should be taken to check and true-up sheave and drum grooving regularly.

The compactness of much modern rope-using equipment has resulted in the use of very small sheaves and drums, which produce heavy bending stresses and compression loads in the rope and, where possible, the sheave sizes shown below should be used. The "critical" sheave size is accepted by ropemakers as being that below which long economical rope life cannot be expected.

SHEAVE AND DRUM DIAMETERS (D = dia. or rope)

Rope Constructions	Sheave diameter			Rope Constructions	Sheave diameter		
	Rec.	Min.	Crit.		Rec.	Min.	Crit.
6 x 7 (6/1)	72D	42D	28D	6 x 37 Seale	30D	19D	14D
6 x 9/9/1 Seale	54D	34D	22D	6 x 37 Filler	27D	18D	14D
6 x 19 Warr.	48D	27D	20D	6 x 41			
6 x 19 Filler	45D	24D	18D	8 x 9/9/1	36D	22D	16D
6 x 19 (12/6/1)	45D	24D	18D	6 x 7/3	72D	42D	28D
6 x 24 (15/9/J)	36D	22D	16D	Flattened			
6 x 37	30D	19D	14D	6 x 12/12/3	48D	32D	21D
(18/12/6/1)				Flat. Strand			

SHEAVE GROOVE SIZES

Rope dia. inches	Groove dia. Tolce.		Rope dia. inches	Groove dia Tolce.	
	min.	max.		min.	max.
1 to 5/16	+1/64"	+1/32"	1-3/16 to 1 1/2	+1/16"	+1/8"
5/16 to 3/8	+1/32"	+1/16"	1-9/16 to 2 1/4	+3/32"	+3/16"
3/8 to 1 1/8	+3/64"	+3/32"	2-5/16 & larger	+1/8"	+1/4"

Example: Groove diameter for 1" diameter rope should be 1-3/64" minimum and 1-3/32" maximum.

GALVANIZED WIRE NETTING

STANDARD QUALITY

RABBIT		SHEEP AND DOG		POULTRY	
Size	Weight per 100 yds., lb.	Size	Weight per 100 yds., lb.	Size	Weight per 100 yds., lb.
12 x $1\frac{1}{4}$ x 17	63	30 x 3 x 17	59	36 x $\frac{1}{2}$ x 22	110
36 x $1\frac{1}{4}$ x 17	165	36 x 3 x 17	67	36 x 1 x 20	86
42 x $1\frac{1}{4}$ x 17	183	36 x 3 x 16	89	36 x 2 x 19	60
12 x $1\frac{1}{2}$ x 17	55	30 x 4 x 17	48	72 x 2 x 19	114
36 x $1\frac{1}{2}$ x 17	138	36 x 4 x 17	57	—	—
42 x $1\frac{1}{2}$ x 17	160	36 x 4 x 16	73	—	—

DRIED FRUIT RACK AND FISH NETTING

36 x 2 x 17	106	60 x 2 x 17	158	36 x 2 x 16	136
48 x 2 x 17	138	72 x 2 x 17	190	72 x 2 x 16	252

NAILS

APPROXIMATE NUMBER PER LB.

Size	No. per lb.	Size	No. per lb.	Size	No. per lb.
1" x 16G	1080	2" x 11G	158	3" x 9G	67
1" x 15G	840	2" x 10G	120	3" x 8G	60
1" x 14G	723	2" x 9G	100	3" x 7G	48
$1\frac{1}{2}$ " x 14G	460	$2\frac{1}{2}$ " x 13G	200	3" x 6G	39
$1\frac{1}{2}$ " x 13G	340	$2\frac{1}{2}$ " x 12G	150	$3\frac{1}{2}$ " x 8G	44
$1\frac{1}{2}$ " x 12G	240	$2\frac{1}{2}$ " x 11G	130	$3\frac{1}{2}$ " x 7G	40
1" x 11G	206	$2\frac{1}{2}$ " x 10G	100	4" x 7G	35
2" x 14G	280	$2\frac{1}{2}$ " x 9G	80	4" x 6G	30
2" x 13G	230	$2\frac{1}{2}$ " x 8G	65	5" x 5G	21
2" x 12G	190	3" x 10G	81	6" x 4G	13

FENCE AND BALING WIRES

LENGTH PER CWT.—BREAKING STRAIN

Gauge	Length per cwt. (yds.)	Approx. weight in lb. (per mile)	Approx. Breaking Strain in lb.	
			Fence Std. Galv.	Baling Self-coloured
8	564	360	15.76	—
9	675	292	—	912
10	854	231	1008	—
12	1293	152	—	475
14	2186	90	—	281
		High Tensile		
12½	1500	135	850	Standard

QUANTITY OF WIRE PER MILE OF FENCING

No. of Wires	Gauge								
	8			10			12½ High-tensile		
	Cwt.	Qr.	Lb.	Cwt.	Qr.	Lb.	Cwt.	Qr.	Lb.
1	3	1	0	2	0	14	1	0	14
2	6	1	14	4	0	14	2	1	14
3	2	2	14	6	1	0	3	2	0
4	12	3	14	8	1	0	4	2	14
5	16	0	14	10	1	14	5	3	14
6	19	1	0	12	1	14	7	0	0

STEEL POSTS — "STAR" PATTERN

Spacings of Posts in feet	No. of Posts per mile	Approximate weight per mile					
		5' 6" lengths			6' 0" lengths		
		Cwt.	Qr.	Lb.	Cwt.	Qr.	Lb.
8	660	45	1	14	49	2	0
9	586	40	1	0	43	3	14
10	528	36	1	0	39	2	0
11	480	33	0	0	36	0	0
12	440	30	1	0	33	0	0
15	352	24	1	0	26	1	14
18	293	20	0	14	22	0	0

STRENGTH OF VARIOUS NON-FERROUS METALS & ALLOYS

Average values for strength based on test data from various testing laboratories. Data are lacking for values of strength in compression. In the absence of such data, a safe practice would be to consider the ultimate in compression as having a value equal to the elastic limit in tension.

Metal	Approximate Composition, per cent.	Weight lb. per cu. in.	Strength in Tension, lb./sq. in.	
			Elastic limit	Ultimate
Copper, cast	Copper, 100	0.310	8,000	25,000
Hard drawn		0.321	30,000	40,000
Zinc, cast	Zinc, 100	0.256	—	9,000
Rolled		0.260	4,000	24,000
Lead, Rolled	Lead, 100	0.411	800	*2,700
Lead alloy, cast ..	Lead, 95.5; anti-mony, 4.5	0.380	4,000	6,400
Nickel, rolled and annealed	Nickel, 100	0.340	12,000	70,000
Cold-rolled		0.340	70,000	165,000
Aluminium, cast ..	Aluminium, 100 ..	0.093	—	13,000
Rolled and annealed		0.097	8,500	14,000
Cold-rolled		0.097	20,000	30,000
Hard-drawn wire ..		0.097	30,000	40,000
Duralumin, rolled and heat-treated	Aluminium, 96; magnesium, 1.5; copper, 2.5	0.102	19,000	55,000
60-40 Brass, cast ..	Copper, 60; zinc, 40	0.310	12,000	35,000
Rolled and annealed		0.310	16,000	60,000
Cold-drawn		0.310	43,000	96,000
Phosphor bronze, cast	Copper, 95; tin, 5;	0.320	16,000	32,000
Rolled and annealed	phosphorus, trace	0.320	13,000	46,000
Cold-drawn		0.320	60,000	85,000
Aluminium-bronze, Cast	Copper, 90; aluminium, 10 ..	0.270	25,000	60,000
Hot-rolled		0.270	30,000	70,000
Cold-drawn		0.270	80,000	90,000
Manganese-bronze, Cast	Copper, 60; zinc, 39; iron and manganese, 1 ..	0.30	30,000	70,000
Rolled		0.30	45,000	70,000
Monel Metal, hot-rolled	Nickel, 67; copper, 28; iron, silicon, carbon and manganese, 5	0.32	48,000	88,000
Cold-rolled and annealed		0.32	60,000	110,000

* Under long-continued static load, lead will flow very slowly under stresses as low as 600 lb. per sq. in.

TINPLATE GAUGE TABLE

Substance (Wt. of Basis Box —31,360 sq. ins.) lb.	Index or Name	Approx. thickness: based on 41.82 lb. sq. ft.		Nearest Gauge No. B.G. Std. Sheet Gge.
		Inch	Mm.	
50 } 55 } 60 }	Taggers	0.00549	0.139	36.7
		0.00604	0.153	35.9
		0.00659	0.167	35.2
65 } 70 } 75 } 80 } 85 } 90 } 95 }	Lights	0.00714	0.181	34.5
		0.00769	0.195	33.8
		0.00824	0.209	33.3
		0.00878	0.223	32.7
		0.00933	0.237	32.2
		0.00988	0.251	31.8
		0.0104	0.265	31.3
100 108 110 112	CL or ICL IC "Common substance"* "112 lb."	0.0110 0.0119 0.0121 0.0123	0.279 0.301 0.307 0.312	30.7 30.1 29.9 29.8
118 122 125 136	IXL or XL IX or X ²	0.0130 0.0134 0.0137 0.0149	0.329 0.340 0.349 0.379	29.3 29.1 28.9 28.2
139 156 156	DC 2X or XX SDC	0.0153 0.0171 0.0171	0.388 0.435 0.435	28.0 26.9 26.9
176 176	3X or XXX SDX	0.0193 0.0193	0.491 0.491	25.9 25.9
180 196 196	DX 4X or XXXX SDXX	0.0198 0.0215 0.0215	0.502 0.547 0.547	25.7 25.0 25.0
216 216	5X or XXXXX SDXXX	0.0237 0.0237	0.602 0.602	24.2 24.2
236 236	6X or XXXXXX SDXXXX	0.0259 0.0259	0.658 0.658	23.4 23.4
240 256	D3X or DXX 7X or XXXXXXX	0.0264 0.0281	0.669 0.714	23.3 22.7

*Standard size 28" x 20"—112 sheets per double box.

NOTE.—Tinplate is always supplied on a weight basis and not thickness (thickness figures are used as a guide only). Determine substance from single sheet weight as follows:—

$$\text{Substance (lb.)} = \frac{\text{Single Sheet Weight} \times 112}{\text{Ratio}}$$

$$\text{Ratio} = \frac{\text{Nominal Sheet Area (sq. in.)}}{280 \text{ (sq. ins.)}}$$

$$280 \text{ sq. ins.} = 14" \times 20" \text{ (basis sheet size).}$$

COPPER—SHEET AND STRIP

GENERAL.—1. Types available: High Conductivity, Commercial, De-oxidised, Arsenical.

2. Finishes available: Hard (Cold) Rolled; Semi, Medium or Half Hard (Cold) Rolled; Soft (Cold) Rolled; Hot (Soft) Rolled.

TRADE SIZES.—Sheets: 26G and heavier (48" x 14" sheathing), 4' x 2', 6' x 2', 6' x 2' 6", 6' x 3', 8' x 3', 6' x 4', 8' x 4', according to gauge.

Strip: .002" and heavier, 5/16" to 15" wide (special manufacture).

WEIGHT PER SQUARE FOOT.—It is customary to order copper sheets by the Imperial Standard Wire Gauge or by weight in pounds and ounces per square foot. A table showing the weight per square foot equivalents to the various gauge numbers, calculated on the assumption that one square foot of rolled copper, 1 inch in thickness, weighs 46½ lb., is detailed below.

I.S.W.G. No.	Decimal of inch	Wt. per sq. ft. in lb.	Equiv. per sq. ft. in lb.	I.S.W.G. No.	Decimal of inch	Wt. per sq. ft. in lb.	Equiv. per sq. ft. in oz.
7/0	.500	23.25	—	23	.024	1.116	18
6/0	.464	21.57	—	24	.022	1.023	16
5/0	.432	20.08	—	25	.020	.930	14
4/0	.400	18.60	—	26	.018	.837	13
3/0	.372	17.29	—	27	.0164	.762	12
2/0	.348	16.18	—	28	.0148	.688	11
0	.324	15.06	—	29	.0136	.632	—
1	.300	13.950	—	30	.0124	.576	9
2	.276	12.834	—	31	.0116	.539	—
3	.252	11.718	—	32	.0108	.502	8
4	.232	10.788	—	33	.0100	.465	—
5	.212	9.858	10	34	.0092	.428	—
6	.192	8.928	9	35	.0084	.391	—
7	.176	8.184	8	36	.0076	.353	—
8	.160	7.440	7½	37	.0068	.316	—
9	.144	6.696	—	38	.0060	.279	—
10	.128	5.952	6	39	.0052	.242	—
11	.116	5.394	—	40	.0048	.223	—
12	.104	4.836	5	41	.0044	.205	—
13	.092	4.278	4¼	42	.0040	.186	—
14	.080	3.720	3¾	43	.0036	.167	—
15	.072	3.348	—	44	.0032	.149	—
16	.064	2.976	3	45	.0028	.130	—
17	.056	2.604	2½	46	.0024	.112	—
18	.048	2.232	2¼	47	.0020	.093	—
19	.040	1.860	2	48	.0016	.074	—
20	.036	1.674	1¾	49	.0012	.056	—
21	.032	1.488	1½	50	.0010	.047	—
22	.028	1.302	1¼				

BRASS—SHEET AND STRIP

GENERAL.—1. Commercial Brass is made in three grades: 7/30 (Deep Drawing); 65/35; 63/37 (Basis Brass).

2. Finishes available: Soft (Cold) Rolled; Semi-Medium or Half Hard (Cold) Rolled; Hard (Cold) Rolled; Extra Hard (Strip only).

TRADE SIZES.—Sheets: 26 gauge and heavier—4' x 2', 6' x 2', 6' x 2' 6", 6' x 3'. Strip: .002" and heavier—5/16" to 15" wide (special manufacture).

WEIGHT PER SQUARE FOOT.—The weight per square foot of rolled brass varies slightly with the composition of the alloy. For the basis of all calculations, the figure used is that one square foot of rolled brass weighs 44½ lb. per square foot one inch in thickness.

I.S.W.G. No.	Decimal of an inch	Weight per sq. ft. in lb.	I.S.W.G. No.	Decimal of an inch	Weight per sq. ft. in lb.
7/0	.500	22.250	23	.024	1.068
6/0	.464	20.648	24	.022	.979
5/0	.432	19.224	25	.020	.890
4/0	.400	17.800	26	.018	.801
3/0	.372	16.540	27	.0164	.729
2/0	.348	15.486	28	.0148	.658
0	.324	14.418	29	.0136	.605
1	.300	13.350	30	.0124	.551
2	.276	12.282	31	.0116	.516
3	.252	11.214	32	.0108	.480
4	.232	10.324	33	.0100	.445
5	.212	9.434	34	.0092	.409
6	.192	8.544	35	.0084	.373
7	.176	7.832	36	.0076	.338
8	.160	7.120	37	.0068	.302
9	.144	6.408	38	.0060	.267
10	.128	5.696	39	.0052	.231
11	.116	5.162	40	.0048	.213
12	.104	4.628	41	.0044	.195
13	.092	4.094	42	.0040	.178
14	.080	3.560	43	.0036	.160
15	.072	3.204	44	.0032	.142
16	.064	2.848	45	.0028	.124
17	.056	2.492	46	.0024	.106
18	.048	2.136	47	.0020	.089
19	.040	1.780	48	.0016	.071
20	.036	1.602	49	.0012	.053
21	.032	1.424	50	.0010	.044
22	.028	1.246	—	—	—

OTHER COPPER ALLOYS ARE—Gilding Metal (four grades), 90/10, 88/12, 85/15, 80/20 (Sheet and Strip); Nickel Silver, 10% (Sheet and Strip), 15%, 18%, 20% (Strip only); Engraving Brass (free cutting), Sheet and Strip; Naval Brass (Improved Muntz Metal), Sheets and Sheathing; Phosphor Bronze (Strip only).

ZINC AND ZINC SHEET

Zinc is manufactured in Australia, and is sold by the ton in the form of slabs weighing approximately 56 lb. each. Zinc can normally be obtained in the form of plates, sheets, and strip.

WEIGHT OF SHEET ZINC

Gauge	Approx. Thick- ness		Approx. weight per sq. ft.	Approx. weight of Sheets					
				6' x 3'		7' x 3'		8' x 3'	
	In.	Mm.	Lb. Oz. Drms.	Lb. Oz. Drms.	Lb. Oz. Drms.	Lb. Oz. Drms.	Lb. Oz. Drms.		
3	.007	.171	0 3 15	4 6 14	5 2 11	5 14 8			
4	.008	.209	0 4 13	5 6 10	6 5 1	7 3 8			
5	.010	.247	0 5 11	6 6 6	7 7 7	8 8 8			
6	.011	.291	0 6 11	7 8 6	8 12 7	10 0 8			
7	.013	.337	0 7 12	8 11 8	10 2 12	12 10 0			
8	.015	.386	0 8 14	9 15 12	11 10 6	13 5 0			
9	.018	.450	0 10 5	11 9 10	13 8 9	15 7 8			
10	.020	.500	0 11 7	12 13 14	15 0 3	17 2 8			
12	.026	.660	0 15 2	17 0 4	19 13 10	22 11 0			
14	.032	.820	1 2 12	21 1 8	24 9 12	28 2 0			
16	.043	1.080	1 8 12	27 13 8	32 7 12	37 2 0			
18	.053	1.340	1 14 11	34 8 6	40 4 7	46 0 8			
20	.063	1.600	2 4 10	41 3 4	48 1 2	54 15 0			
22	.077	1.960	2 12 14	50 7 12	58 14 6	67 5 0			
24	.091	2.320	3 5 3	59 13 6	69 12 15	79 12 8			
26	.105	2.680	3 13 7	69 1 14	80 10 3	92 2 8			

PROCESS ENGRAVERS' ZINC

Process engravers' zinc is supplied in 40" x 20" plates, polished on one side, and in 8, 10, 12, 14 and 16 I.S.W.G. The following table gives weights of these standard sizes of plates.

40" x 20" x	8G	10G	12G	14G	16G
Weight of plate	33 lb.	26½ lb.	22 lb.	16½ lb.	13 lb.
No. of Plates/Case ..	14	18	22	30	36

LEAD AND LEAD SHEET

WEIGHT PER SQUARE FOOT

Thick	Lb.	Thick	Lb.	Thick	Lb.
1/16"	3.7	7/16"	25.9	3/4"	44.7
1/8"	7.4	1/2"	29.5	13/16"	48.3
3/16"	11.1	9/16"	33.2	7/8"	51.0
1/4"	14.8	5/8"	36.9	15/16"	55.1
5/16"	18.5	11/16"	40.6	1"	59.4
3/8"	22.2				

STANDARD SIZES (20' and 30' lengths)

Sheet Lead.—Widths: 2' 6", 3', 3' 9", 5', 7' 6"; weights: 3 lb./sq. ft. and heavier.

Dampcourse.—Widths: 4½", 6", 9", 12", 14", 18"; weights: 2, 3, 4, 5 and 6 lb./sq. ft.

MONEL METAL AND NICKEL

WEIGHTS OF ROUNDS, SQUARES, AND HEXAGONS

Size in inches	Lb. per foot			Size in inches	Lb. per foot		
	Rounds	Squares	Hexs.		Rounds	Squares	Hexs.
7/32	.146	—	—	2	12.178	15.504	13.426
1/4	.190	—	.209	2 1/16	13.747	17.503	15.156
5/16	.297	.379	.327	2 1/8	15.411	19.622	16.991
3/8	.428	.545	.472	2 1/4	17.171	21.863	18.921
7/16	.583	.742	.643	2 3/8	19.027	24.225	20.977
1/2	.761	.969	.839	2 1/2	20.977	26.708	23.127
9/16	.963	1.226	1.062	2 3/4	23.022	29.312	25.382
5/8	1.189	1.514	1.311	2 7/8	25.162	32.038	27.741
11/16	1.439	1.832	1.586	3	27.399	34.884	30.207
3/4	1.712	2.180	1.887	3 1/16	32.155	40.940	35.451
13/16	2.010	2.559	2.216	3 1/8	37.291	47.481	41.113
7/8	2.331	2.968	2.570	3 1/4	42.810	54.506	47.198
15/16	2.766	3.407	2.940	3 1/2	48.706	62.016	53.698
1	3.044	3.876	3.356	4 1/4	54.985	70.010	60.621
1-1/16	3.436	4.376	3.778	4 1/2	61.644	78.489	67.963
1-1/8	3.853	4.906	4.248	4 3/4	68.714	87.452	75.757
1-3/16	4.293	5.466	4.733	5	76.105	96.900	83.906
1-1/4	4.756	6.056	5.243	5 1/16	83.908	106.832	92.509
1-5/16	5.244	6.677	5.782	5 1/8	92.086	117.249	101.525
1-3/8	5.756	7.328	6.346	5 1/4	100.648	128.150	110.964
1-7/16	6.291	8.009	6.934	5 1/2	109.590	139.536	120.823
1-1/2	6.849	8.721	7.551	6 1/4	118.916	151.406	131.105
1-9/16	7.432	9.463	8.194	6 1/2	128.617	163.761	141.800
1-5/8	8.039	10.235	8.863	6 3/4	138.703	176.600	152.910
1-11/16	8.669	11.038	9.558	7	149.168	189.924	164.458
1-3/4	9.321	11.870	10.276	7 1/8	160.009	203.733	176.410
1-13/16	10.001	12.733	11.026	7 1/4	171.238	218.025	188.790
1-7/8	10.702	13.627	11.799	7 3/4	182.843	232.802	201.584
1-15/16	11.428	14.550	12.599	8	194.827	248.064	214.797

ALUMINIUM

	Alloy and Temper	U.T.S. lb./sq. in.	Elongation % on 2"	Description
Sheet	2S-O	12,000	35	{ Commercially pure aluminium, used where strength not important.
	2S-H14	17,000	9	
	3S-O	15,500	35	{ Aluminium alloyed with manganese, used where medium strength is required with formability and resistance to corrosion.
	3S-H14	21,000	8	
	3S-H18	30,000	4	
	M57S-O	26,500	24	{ Aluminium alloyed with magnesium and manganese, used where high strength and corrosion-resistance are required.
	M57S-H34	34,000	9	
	M57S-H38	39,000	7	
Extrusions	2S-F	12,000	35	{ Commercially pure aluminium, strength unimportant.
	50S-T5	26,000	18	{ Aluminium alloyed with silicon and manganese, medium strength.
	51S-T5	44,000	12	{ Aluminium alloyed with silicon and manganese, high strength.

WEIGHT PER SQUARE FOOT

I.S.W.G.	Decimals of an inch	Weight per sq. ft. lb.	I.S.W.G.	Decimals of an inch	Weight per sq. ft. lb.
—	.500	7.042	12	.104	1.465
—	.4375	6.161	14	.080	1.127
—	.375	5.281	16	.064	0.9013
—	.3125	4.401	18	.048	0.6760
—	.250	3.521	19	.040	0.5633
—	.187	2.641	20	.036	0.5070
8	.160	2.253	22	.028	0.394
10	.128	1.803	24	.022	0.3098
—	.125	1.760	26	.018	0.2535

Dimensions, ins.		Est. Wght. per ft. in lb.	Dimensions, ins.		Est. Wght. per ft. in lb.	Dimensions, ins.		Est. Wght. per ft. in lb.
A	B		A	B		A	B	
3-3/4	3/4	10.268	1-1/2	1/16	.342	3/4	5/8	1.71
3-9/16	.35	4.549	1-3/8	7/8	4.389	3/4	1/2	1.368
3-1/2	1/2	6.384	1-3/8	1/2	2.508	3/4	3/8	1.026
3	3/4	8.216	1-3/8	3/8	1.881	3/4	5/16	.855
3	1/4	2.736	1-3/8	3/16	.94	3/4	1/4	.684
2-13/16	.95	9.747	1-3/8	1/8	.627	3/4	3/16	.513
2-3/4	5/16	3.135	1-5/16	9/16	2.692	3/4	1/8	.342
2-1/2	3/8	3.42	1-1/4	1/8	.285	3/4	1/16	.171
2-3/8	1/2	4.332	1-1/4	3/4	4.561	11/16	1/8	.314
2-1/4	7/8	7.182	1-1/4	5/8	3.421	5/8	1/2	1.14
2-1/4	1/4	2.052	1-1/4	1/2	2.85	5/8	3/8	.855
2-1/8	1/2	3.876	1-1/4	1/2	2.281	5/8	1/4	.57
2	1	7.296	1-1/4	3/8	1.71	5/8	3/16	.427
2	1/2	3.648	1-1/4	1/4	1.14	5/8	1/8	.285
2	7/16	3.192	1-1/4	3/16	.855	9/16	5/16	.64
2	3/8	2.736	1-1/4	1/8	.57	1/2	3/8	.684
2	1/4	1.824	1-1/8	1/2	2.052	1/2	5/16	.570
2	3/16	1.368	1-1/8	1/4	1.026	1/2	1/4	.456
2	1/8	.912	1-1/8	7/32	.898	1/2	3/16	.342
1-3/4	1-1/8	7.182	1-1/8	3/16	.77	1/2	1/8	.228
1-3/4	1	6.384	1	1/2	2.052	1/2	1/16	.114
1-3/4	1/4	1.596	1	1/4	1.026	7/16	3/8	.599
1-3/4	1/8	.798	1	3/4	2.736	3/8	5/16	.428
1-1/2	1-1/4	6.840	1	5/8	2.28	3/8	1/4	.342
1-1/2	1	5.472	1	1/2	1.824	3/8	3/16	.256
1-1/2	3/4	4.108	1	3/8	1.368	3/8	1/8	.171
1-1/2	1/2	2.736	1	1/16	.228	3/8	7/64	.149
1-1/2	3/8	2.052	7/8	3/4	2.394	3/8	1/16	.085
1-1/2	1/4	1.368	7/8	5/8	1.995	11/32	17/64	.334
1-1/2	3/16	1.026	7/8	1/2	1.596	5/16	1/4	.285
1-1/2	1/8	.684	7/8	1/8	.399	5/16	3/32	.107
			13/16	1/2	1.482	.285	5/64	.081
						1/4	3/16	.171
						1/4	1/8	.114
						1/4	.075	.068
						3/16	1/8	.085

Brass and Copper — Rods and Bars

WEIGHT PER LINEAL FOOT — LB.

SQUARE

ROUND

Side Inches	SPECKLE		Dia. in inches	ROUND	
	Brass	Copper		Brass	Copper
1/8	.057	.06	1/8	.045	.047
3/16	.128	.135	3/16	.101	.106
1/4	.228	.240	1/4	.179	.189
5/16	.357	.376	5/16	.280	.294
-3/8	.513	.541	3/8	.403	.424
7/16	.699	.736	7/16	.549	.578
1/2	.913	.962	1/2	.717	.755
9/16	1.15	1.21	9/16	.91	.955
5/8	1.43	1.51	5/8	1.12	1.18
11/16	1.73	1.82	11/16	1.35	1.43
3/4	2.05	2.16	3/4	1.61	1.70
13/16	2.41	2.54	13/16	1.89	1.99
7/8	2.80	2.95	7/8	2.19	2.31
15/16	3.21	3.38	15/16	2.52	2.65
1	3.65	3.85	1	2.87	3.02
1-1/8	4.62	4.87	1-1/8	3.63	3.83
1-1/4	5.70	6.01	1-1/4	4.48	4.73
1-3/8	6.90	7.27	1-3/8	5.42	5.72
1-1/2	8.21	8.65	1-1/2	6.45	6.80
1-5/8	9.64	10.16	1-5/8	7.57	7.99
1-3/4	11.18	11.78	1-3/4	8.78	9.26
1-7/8	12.83	13.52	1-7/8	10.08	10.63
2	14.60	15.39	2	11.47	12.10
2-1/8	—	—	2-1/8	12.94	13.66
2-1/4	—	—	2-1/4	14.51	15.31
2-3/8	—	—	2-3/8	16.17	17.06
2-1/2	—	—	2-1/2	17.92	18.90

Whitworth Standard Hexagon Sizes

Association		Across flats min. to max.		Lb. per lin. ft.	Standard		Across flats min. to max.		Lb. per lin. ft.
					Whit.	Fine			
		ins.	ins.		ins.	ins.	ins.	ins.	
No. 3		.279	.282	.251	1/2	9/16	.915	.920	2.68
No. 2		.321	.324	.332	9/16	5/8	1.002	1.010	3.22
No. 1		.362	.365	.421	5/8	11/16	1.092	1.100	3.82
No. 0		.410	.413	.539	11/16	3/4	1.192	1.200	4.55
Standard					3/4	7/8	1.292	1.300	5.34
Whit.	Fine				7/8	1	1.468	1.480	6.92
ins.	ins.				1	1-1/8	1.658	1.670	8.81
—	7/32	.410	.413	.539	1-1/8	1-1/4	1.845	1.860	10.94
—	1/4	.440	.445	.626	1-1/4	1-3/8	2.035	2.050	13.29
1/4	5/16	.520	.525	.871	1-3/8	1-1/2	2.200	2.220	15.58
5/16	3/8	.595	.600	1.14	1-1/2	1-5/8	2.390	2.410	18.36
3/8	7/16	.705	.710	1.59	1-5/8	1-3/4	2.555	2.580	21.03
7/16	1/2	.815	.820	2.13	1-3/4	2	2.735	2.760	24.07
					2	—	3.125	3.150	31.35

NON-FERROUS WIRE

WEIGHT PER 100 FEET IN POUNDS

Thickness		Copper or Bronze	Brass or Muntz	Alumin- ium	Nickel Silver	Monel Metal or Nickel
Inches	I.S.W.G.					
0.5	7/0	75.7	71.9	22.93	74.1	76.1
0.372	3/0	41.9	39.8	12.77	41	42.76
0.324	0	31.8	30.2	7.63	31.1	31.9
0.276	2	23.1	21.9	7.00	22.6	23.16
0.252	3	19.2	18.3	5.83	18.8	19.20
0.232	4	16.3	15.5	4.96	15.9	16.37
0.192	6	11.2	10.6	3.4	10.9	11.18
0.160	8	7.75	7.36	2.35	7.58	7.77
0.128	10	4.96	4.71	1.53	4.85	4.98
0.104	12	3.27	3.11	0.99	3.20	3.28
0.080	14	1.94	1.84	0.66	1.9	1.93
0.064	16	1.24	1.18	0.377	1.21	1.25
0.048	18	0.698	0.663	0.212	0.682	0.695
0.036	20	0.392	0.373	0.119	0.384	0.387
0.028	22	0.237	0.226	0.072	0.232	0.238
0.022	24	0.146	0.139	0.044	0.143	0.147
0.018	26	0.0981	0.0932	0.0297	0.096	0.098
0.0148	28	0.0663	0.0630	0.0201	0.0649	0.066
0.0124	30	0.0465	0.0442	0.0141	0.0455	0.046
0.0108	32	0.0353	0.0336	0.0108	0.0345	0.035
0.0092	34	0.0256	0.0243	0.0077	0.0250	0.025
0.0076	36	0.0175	0.0166	0.0053	0.0171	0.017

C.M.A. Cables—Single V.I.R., Braided and Compounded

Nominal area in sq. in.	No. and dia. of wires in ins.	Overall dia. in inches		Weight per 100 yds. in lb.		Rating Current SAA Wiring Rules in Amps.	Stand. Resist. (ohms) per 1000 yds. @ 60°F.
		660V	250V	660V	250V		
.0015	1/.044	.205	.150	7	5	8	15.79
.002	3/.029	.225	.175	8	6	10	12.36
.003	1/.064	.230	.175	10	7	15	8.019
.003	3/.036	.245	.195	10	8	15	7.463
.0045	7/.029	.265	.205	13	10	20	5.281
.007	7/.036	.290	.230	17	14	27	3.427
.010	7/.044	.315	.280	23	20	35	2.294
.0145	7/.052	.340	.310	29	27	45	1.643
.0225	7/.064	.380	.355	41	38	55	1.084
.03	19/.044	.410	.390	50	48	65	0.8468

Weight of Drawn Copper Bars

STANDARD RECTANGULAR SIZES

POUNDS PER LINEAL FOOT

Size ins.	Pounds	Size ins.	Pounds	Size ins.	Pounds
1 — x 16	$\frac{1}{16}$.1206	1	1.447	1	2.894
	$\frac{1}{8}$.1507	$1\frac{1}{4}$ 1.809	$1\frac{1}{4}$ 3.617		
	$\frac{3}{16}$.1809	$1\frac{1}{2}$ 2.170	$1\frac{1}{2}$ 4.341		
	$\frac{1}{4}$.2110	$1\frac{3}{4}$ 2.532	$1\frac{3}{4}$ 5.064		
	$\frac{5}{16}$.2412	2	2.894	2	5.788
	$\frac{3}{8}$.3014	$2\frac{1}{4}$ 3.256	$2\frac{1}{4}$ 6.511		
	$\frac{1}{2}$.3617	$2\frac{1}{2}$ 3.617	$2\frac{1}{2}$ 7.235		
		$2\frac{3}{4}$ 3.979	$2\frac{3}{4}$ 7.958		
1 — x 8	$\frac{1}{2}$.2412	3 — x 8	3 4.341	3	8.681
	$\frac{3}{8}$.3014		$3\frac{1}{4}$ 4.702	$3\frac{1}{4}$ 9.405	
	$\frac{1}{4}$.3617		$3\frac{1}{2}$ 5.064	$3\frac{1}{2}$ 10.13	
	$\frac{3}{16}$.4220		$3\frac{3}{4}$ 5.426	$3\frac{3}{4}$ 10.85	
	$\frac{1}{8}$.4823	4	5.788	4	11.58
	$\frac{1}{4}$.6029	$4\frac{1}{4}$ 6.149	$4\frac{1}{4}$ 12.30		
	$\frac{3}{8}$.7235	$4\frac{1}{2}$ 6.511	$4\frac{1}{2}$ 13.02		
	$\frac{1}{2}$.8440	$4\frac{3}{4}$ 6.873	$4\frac{3}{4}$ 13.75		
	$\frac{5}{8}$.9646	5	7.235	5	14.47
	$\frac{3}{4}$ 1.085			$5\frac{1}{4}$ 15.19	
	$\frac{7}{8}$ 1.206			$5\frac{1}{2}$ 15.92	
	1 .1326			$5\frac{3}{4}$ 16.64	
3 — x 16	1.447			6 17.36	
	$\frac{1}{16}$.3617	1	1.929	1	3.858
	$\frac{1}{8}$.4522	$1\frac{1}{4}$ 2.412	$1\frac{1}{4}$ 4.823		
	$\frac{3}{16}$.5426	$1\frac{1}{2}$ 2.894	$1\frac{1}{2}$ 5.788		
	$\frac{1}{4}$.6330	$1\frac{3}{4}$ 3.376	$1\frac{3}{4}$ 6.752		
	$\frac{3}{8}$.7235	2	3.858	2	7.717
	$\frac{1}{2}$.9043	$2\frac{1}{4}$ 4.341	$2\frac{1}{4}$ 8.681		
	$\frac{5}{8}$ 1.085	$2\frac{1}{2}$ 4.823	$2\frac{1}{2}$ 9.646		
	$\frac{3}{4}$ 1.266	$2\frac{3}{4}$ 5.305	$2\frac{3}{4}$ 10.61		
	1 .1447	3	5.788	3	11.58
	$1\frac{1}{4}$ 1.628	$3\frac{1}{4}$ 6.270	$3\frac{1}{4}$ 12.54		
	$1\frac{1}{2}$ 1.809	$3\frac{1}{2}$ 6.752	$3\frac{1}{2}$ 13.50		
1 — x 4	$1\frac{3}{4}$ 1.989	4	7.235	$3\frac{3}{4}$ 14.47	
	2 .2170	$4\frac{1}{4}$ 8.199	4 15.43		
	$\frac{1}{16}$.4823	$4\frac{1}{2}$ 8.681	$4\frac{1}{4}$ 16.40		
	$\frac{1}{8}$.6029	$4\frac{3}{4}$ 9.164	$4\frac{1}{2}$ 17.36		
	$\frac{3}{16}$.7235	5	9.646	$4\frac{3}{4}$ 18.33	
	$\frac{1}{4}$.8440	$5\frac{1}{4}$ 10.13	5 18.29		
	$\frac{3}{8}$.9646	$5\frac{1}{2}$ 10.61	$5\frac{1}{4}$ 20.26		
	$\frac{1}{2}$ 1.206	$5\frac{3}{4}$ 11.09	$5\frac{1}{2}$ 21.22		
	$\frac{3}{4}$ 1.447	6 11.58	$5\frac{3}{4}$ 22.19		
	$\frac{5}{8}$ 1.688		6 23.15		
	1 .1929				
	$1\frac{1}{4}$ 2.170				
	$1\frac{1}{2}$ 2.412				
	$1\frac{3}{4}$ 2.653				
	2 .2894				

SOLID DRAWN COPPER TUBES

COMMERCIAL QUALITY

Standard sizes—weight in lb. per linear foot. Calculated on a basis of copper at .323 lb. per cubic inch.

To find the weight of tubes composed of the following metals, multiply the weights of the equivalent copper tubes by the constants shown:—60/50 brass, 0.942; 70/30 brass, 0.958; aluminium, 0.304.

Imperial Standard Wire Gauge	1	2	4	6	8	10	11	12	13	14	16	18	20	22	24
Dec. equiv. in inches	.300	.276	.232	.192	.160	.128	.116	.104	.092	.080	.064	.048	.036	.028	.022
External diameter inch															
1/8	—	—	—	—	—	—	—	—	—	—	—	—	.038	.033	.027
3/16	—	—	—	—	—	—	—	—	—	—	—	.082	.066	.054	.043
1/4	—	—	—	—	—	—	—	—	—	.14	.12	.093	.075	.060	—
5/16	—	—	—	—	—	—	—	—	—	.19	.15	.12	.10	.077	—
3/8	—	—	—	—	—	—	—	—	.29	.24	.19	.15	.12	.094	—
7/16	—	—	—	—	—	—	—	.35	.29	.23	.18	.14	.11	—	—
1/2	—	—	—	—	—	.58	—	.50	.41	.34	.26	.20	.16	.13	—
9/16	—	—	—	—	—	—	—	—	.47	.39	.30	.23	.18	—	—
5/8	—	—	—	—	—	—	—	.66	.53	.44	.34	.26	.20	—	—
11/16	—	—	—	—	—	—	—	.74	.59	.48	.37	.28	.22	—	—
3/4	—	—	—	—	—	.97	—	.82	.65	.53	.41	.31	.25	—	—
13/16	—	—	—	—	—	1.06	—	.89	.80	.71	.58	.45	.34	.27	—
7/8	—	—	—	—	—	1.16	—	.97	—	.77	.63	.48	.37	.29	—
15/16	—	—	—	—	—	1.25	—	1.05	—	.83	.68	.52	.39	.31	—
1	—	—	—	—	1.76	1.35	—	1.13	—	.89	.73	.55	.42	.33	—
1-1/32	—	—	—	—	—	—	—	.92	—	1.04	.92	—	—	—	—
1-1/8	—	—	—	2.17	1.87	1.54	—	1.29	—	1.01	.82	.63	.48	.37	—
1-1/4	—	—	—	2.46	2.11	1.74	—	1.45	—	1.13	.92	.70	.53	.42	—
1-9/32	—	—	—	—	—	—	—	1.48	—	—	—	—	—	—	—
1-3/8	—	—	—	2.75	2.36	1.94	—	1.60	—	1.26	1.02	.77	.58	—	—
1-1/2	—	—	—	3.04	2.60	2.13	—	1.76	—	1.38	1.11	.85	.64	—	—
1-5/8	—	—	—	3.33	2.84	2.32	—	1.92	—	1.50	1.21	.92	.69	—	—
1-3/4	—	—	—	3.62	3.08	2.52	—	2.08	—	1.62	1.31	.99	.75	—	—
1-7/8	—	—	—	3.92	3.33	2.71	—	2.23	—	1.74	1.41	1.06	.80	—	—
2	—	—	—	4.21	3.57	2.90	—	2.39	—	1.86	1.50	1.14	.86	—	—
2-1/8	—	—	5.32	4.50	3.81	3.09	—	2.55	—	1.98	1.60	1.21	.92	—	—
2-1/4	—	—	5.67	4.79	4.05	3.29	—	2.71	—	2.10	1.70	1.28	.97	—	—
2-5/16	—	—	—	—	—	—	3.09	—	—	2.17	—	—	—	—	—
2-3/8	—	—	6.03	5.08	4.30	3.49	—	2.86	—	2.23	1.79	1.35	1.02	—	—
2-1/2	—	—	6.38	5.37	4.54	3.68	—	3.02	—	2.35	1.89	1.43	1.08	—	—
2-5/8	—	—	6.73	5.66	4.78	3.87	—	3.18	—	2.47	1.99	1.50	1.13	—	—
2-3/4	—	—	7.08	5.95	5.02	4.07	—	3.34	—	2.59	2.08	1.57	1.18	—	—
2-7/8	—	—	7.43	6.25	5.27	4.26	—	3.49	—	2.71	2.18	1.65	1.24	—	—
2-15/16	—	—	—	—	—	—	3.97	—	—	2.77	—	—	—	—	—
3	—	9.12	7.78	6.54	5.51	4.45	—	3.65	—	2.83	2.28	1.72	1.29	—	—
3-1/4	—	9.96	8.48	7.12	5.99	4.84	—	3.97	—	3.07	2.47	1.86	—	—	—
3-7/16	—	—	—	—	—	5.13	—	—	—	—	—	—	—	—	—
3-1/2	—	10.79	9.19	7.70	6.48	5.23	—	4.28	—	3.32	2.67	2.01	—	—	—
3-3/4	—	11.63	8.89	8.28	6.96	5.62	—	4.60	—	3.56	2.86	2.15	—	—	—
4	13.47	12.47	10.59	8.87	7.45	6.00	—	4.91	—	3.80	3.05	2.30	—	—	—
4-1/4	14.38	13.31	11.29	9.45	7.93	6.39	—	5.23	—	4.04	3.25	—	—	—	—
4-1/2	15.28	14.14	12.00	10.03	8.42	6.78	—	5.54	—	4.29	3.44	—	—	—	—
4-3/4	16.19	14.98	12.70	10.61	8.90	7.17	—	5.86	—	4.53	—	—	—	—	—
5	17.11	15.82	13.40	11.20	9.39	7.55	—	6.17	—	4.77	3.83	—	—	—	—
5-1/2	18.92	17.49	14.81	12.36	10.36	8.33	—	6.80	—	—	—	—	—	—	—
6	20.75	19.17	16.21	13.53	11.33	9.10	—	7.43	—	—	—	—	—	—	—
6-1/2	22.56	20.84	17.62	14.69	12.30	9.88	—	8.06	—	—	—	—	—	—	—
7	24.39	22.52	19.02	15.86	13.27	10.65	—	8.69	—	—	—	—	—	—	—
7-1/2	26.20	24.19	20.43	17.02	14.24	11.43	—	9.32	—	—	—	—	—	—	—
8	28.03	25.87	21.83	18.19	15.21	12.20	—	—	—	—	—	—	—	—	—
8-1/2	29.84	27.54	23.24	19.35	16.18	12.98	—	—	—	—	—	—	—	—	—
9	31.67	29.22	24.64	20.52	17.15	13.75	—	—	—	—	—	—	—	—	—
9-1/2	33.45	30.86	26.06	21.66	18.11	14.54	—	—	—	—	—	—	—	—	—

ELECTRICITY

FUNDAMENTAL UNITS:

The AMPERE is the unit in which electric current strength is measured.

The OHM is the unit in which resistance to the flow of an electric current is measured.

The VOLT is the unit of electric pressure. A pressure of 1 volt is required to force a current of 1 ampere through a resistance of 1 ohm.

WATT.—This is the unit of power or rate of doing work.

$$\text{Watts} = \text{Volts} \times \text{Amperes.}$$

KILOWATT HOUR.—For commercial purposes electrical energy is charged for in units of 1,000 watt hours, and is called the Board of Trade unit or kilowatt hour.

$$\text{K.W.H.} = \frac{\text{Volts} \times \text{Amperes} \times \text{Hours}}{1,000} \quad \text{or} \quad \frac{\text{Watts} \times \text{Hours}}{1,000}$$

Example: To find the cost of burning three 60-watt lamps for five hours, assuming the cost per unit to be 6d.—

$$\text{Cost} = \frac{60 \times 3 \times 5 \times 6d.}{1,000} = 5.4d.$$

$$\text{HORSEPOWER} = \frac{\text{Watts}}{746}$$

$$\text{Kilowatts} = \frac{\text{Watts}}{1,000}$$

The normal voltage for household appliances is 240; for 3-phase motors, etc., 415.

HINTS:

Do NOT take risks with electricity.

Do NOT use frayed or damaged cords or flexibles on portable appliances—THEY ARE DANGEROUS.

WATER is injurious to most electrical equipment.

DO NOT handle wet or damp metal-clad switchgear unless it is effectively EARTHED. If in doubt, have it inspected by a competent electrician, or cover the hand with a rubber glove, several thicknesses of dry cloth, or similar material before attempting to touch.

A cable carrying electric current (amperes) greater than its capacity will develop heat. This is injurious to insulation (except in special applications) and uneconomical.

The fuse is there for protection. ALWAYS use the correct wire sizes and material (usually copper) when replacing fuses. Over-size fuse wire is dangerous.

In all cases of electric shock, remove person from danger zone and apply artificial respiration until medical aid arrives.

Average District Rainfall Throughout Australia

PERIOD 1911 TO 1940 (100 Points = 1 inch)

	DISTRICT	Annual fall, Points	DISTRICT	Annual fall, Points
N.S.W.	Western Far North West	829	Hunter	3463
	Western Lower Darling	967	Central Tablelands North	2310
	Western Upper Darling	1282	Central Tablelands South	3342
	Western S.W. Plains	1287	Central Western Slopes North	2285
	Central Western Plains South	1746	Central Western Slopes South	2193
	Central Western Plains North	1713	Metropolitan East	4190
	North-west Plains East	2181	Metropolitan West	3004
	North-west Plains West	1838	Illawarra	4340
	North-west Slopes North	2606	South Coast	3628
	North-west Slopes South	2428	Southern T'lands, Goulburn, Monaro	2495
	Northern Tablelands Western	3045	Southern Tablelands, Snowy Mts. .	3338
	Northern Tablelands Eastern	3755	South-west Slopes South	3343
	North Coast Upper	5544	South-west Slopes North	2353
	North Coast Lower	5563	Riverina East	1846
	Manning	5350	Riverina West	1371
VIC.	Mallee North	1123	East Gippsland	3021
	Mallee South	1335	West Gippsland	3570
	North Wimmera	1578	East Central	3472
	South Wimmera	1892	West Central	2355
	Lower North	1655	North Central	2816
	Upper North	1951	Western Plains	2432
	Lower North-east	3038	West Coast	2929
	Upper North-east	4365		
TAS.	Northern	3776	Central Plateau	5055
	East Coast	3118	West Coast	9625
	Midland	2270	King Island	3330
	South-east	2772	Flinders Island	3010
	Derwent Valley	2824		
S.A.	North-west Interior	741	Central West	1688
	Far North Interior	613	Central East	2338
	Western	1304	Murray Valley	1219
	Upper North	1247	Murray Mallee	1183
	North-east	771	Upper South-east	1658
	Lower North	1665	Lower South-east	2550
W.A.	North Kimberley	3116	North Coastal	1590
	East Kimberley	1493	Central Coastal	3549
	West Kimberley	2008	South Coastal	3675
	De Grey	1181	Central North	1386
	Fortescue	995	Central South	1710
	West Gascoyne	845	Eucla	740
	East Gascoyne	953	South-east	1037
	Murchison	869	North-east	923
N.T.	Northern Rivers	4264	Northern Plateau	1232
QLD.	Peninsula North	5575	Upper West	1430
	Peninsula South	3605	Lower West	911
	Carpentaria Lower	2420	South Coast, Port Curtis	3640
	Carpentaria Upper	2404	South Coast, Moreton	4156
	North Coast, Barrow	6255	Darling Downs East	2599
	North Coast, Herbert	8412	Darling Downs West	2130
	Central Coast East	3694	Maranoa	2066
	Central Coast West	2254	Warrego	1621
	Central Highlands	2318	Far South West	1121
	Central Lowlands	1754		

Occupation of the Population — Australia

CENSUS OF 1933, 1947 AND 1954

(Exclusive of Full-blood Aborigines)

Class of Industry	Census 1933	Census 1947	Census 1954
Fishing and Trapping	14,611	16,393	10,129
Agricultural and Pastoral, etc. ..	547,787	459,502	467,823
Forestry	26,133	22,124	15,346
Mining, etc.	68,250	54,391	61,371
Industrial—			
Manufacturing	511,511	799,215	1,027,331
Building	107,446	232,433	325,622
Roads, Earthworks, etc.	217,656		
Other	29,558	30,585	73,650
TOTAL INDUSTRIAL	866,171	1,062,233	1,426,603
Transport and Communication ..	223,893	295,567	335,835
Commerce, etc.	451,172	479,230	676,025
Public Administration, etc.	232,212	348,811	446,917
Entertainment, etc.	24,250	225,566	224,489
Domestic Service	242,378		
No Industry, etc.	195,430	232,534	37,484
Pensioners	263,064	4,382,927	5,284,508
Dependants	3,474,218		
TOTAL	6,629,839	7,579,358	8,986,530

Government Railways Statistics, 1957-58

Government	Route Mileage	Gross Revenue £000	Working Expenses £000	Net Revenue £000
Commonwealth	2,252	5,346	3,611	1,735
N.S.W.	6,103	74,433	72,534	1,899
Victoria	4,401	35,954	38,174	2,220
Queensland	6,456	34,636	36,894	2,258
South Australia	2,533	13,160	15,953	2,793
Western Australia	4,117	12,788	16,091	3,303
Tasmania	565	2,569	3,218	649
TOTAL	26,427	178,886	186,475	7,589

GAUGES OF GOVERNMENT RAILWAYS

5' 3"	6,018 miles	3' 6"	12,843 miles
4' 8½"	7,502 miles	Other	64 miles

Area and Population

State or Territory	Year of formation into separate Colony or Territory	Present Area in square miles	Estimated Population, 31st March, 1959		
			Male	Female	Persons
N.S.W. ...	1786	309,432	1,876,176	1,869,025	3,745,201
Vic.	1851	87,884	1,408,274	1,388,685	2,796,959
Qld.	1859	667,000	730,608	698,048	1,428,656
S.A.	1834	380,070	462,996	451,767	914,763
W.A. ...	1829	975,920	366,345	348,224	714,569
Tas.	1825	26,215	178,590	165,400	343,990
N. Ter. ..	1863	523,620	10,954	8,793	19,747
A.C.T. ..	1911	940	23,872	20,908	44,780
TOTAL ..	—	297,081	5,057,815	4,950,850	10,008,665

NOTE.—The six States with their included Territories were Federated under the name "Commonwealth of Australia" on January 1, 1901.

Population and Vital Statistics

AUSTRALIA, 1945 TO 1958

Heading		1945	1954	1958
Population at 31st December (,000 omitted)	Males ..	3,722	4,598	5,029
	Females ..	3,708	4,492	4,922
	Total ..	7,430	9,090	9,951
Births	Males ..	82,457	103,555	113,957
	Females ..	78,103	98,701	108,547
	Total ...	160,560	202,256	222,504
	Rate ...	21.7	22.5	22.6
Marriages	No.	62,282	71,229	74,001
	Rate ...	8.5	7.9	7.5
Deaths	Males ..	38,211	45,787	47,050
	Females ..	32,020	36,018	36,673
	Total ...	70,231	81,805	83,723
	Rate ...	9.5	9.1	8.5
Deaths of children under one year	Males ..	2,685	2,608	N.A.
	Females ..	2,032	1,938	N.A.
	Total ...	4,717	4,546	4,560
	Rate ...	29.4	22.5	20.5
Natural increase		90,329	120,451	138,781
Rate of natural increase ...		12.22	13.40	14.1

NOTE.—In the case of Births, Marriages, Deaths, and Natural Increase, the "Rate" is the number per 1,000 of mean population; in the case of Deaths of Children under one year, it is the number per 1,000 births.

RATES OF POSTAGE AS FROM 1st OCTOBER, 1959

WITHIN AUSTRALIA

(Including Christmas Island, Cocos Island, Lord Howe Island, Norfolk Island, Nauru, and the Territory of Papua-New Guinea.)

Category	Rates of Postage	Maximum weight
LETTERS — Including Letter-cards and Postcards	5d. first oz., 3d. each additional oz. or part of oz.	—
OTHER ARTICLES — Including Business Papers, Printed Papers and Merchandise	5d. first 4 oz., 3d. each additional 4 oz. or part of 4 oz.	6½ lb. (single vol. printed matter 11 lb.), Patterns, Samples and Merchandise 1 lb.
NEWSPAPERS, PERIODICALS AND BOOKS — Registered at a G.P.O. for postal transmission as such	5d. each 8 oz. or part of 8 oz.	6½ lb. (single vol. 11 lb.).
Articles impressed for the use of the Blind	Free.	15 lb.

PARCELS POST—Maximum weight 11 lb.

Destination	Parcels Not Exceeding			
	2 lb.	3 lb.	7 lb.	11 lb.
Within 30 miles of office of posting	2 0	2 6	4 0	5 0
Within the State, but beyond 30 miles	2 6	3 0	5 0	7 6
Adjoining States (as defined in P.O. Guide)	3 0	4 0	7 6	10 0
Elsewhere in Australia	4 0	6 0	10 0	14 0

NOTES.—1. A.C.T., Lord Howe Island, and Norfolk Island are regarded as being within N.S.W.

2. Cocos (Keeling) Island and Christmas Island are regarded as being within Western Australia.

3. Territory of Papua-New Guinea is regarded as an adjoining State to Queensland.

4. Nauru—see Section 8, Post Office Guide.

OVERSEAS

Category	British C'wealth (See list below)	Other Countries	Max. Weight
Letters and Letter Cards	5d. first oz., 3d. each additional oz. or part of oz.	8d. first oz., 5d. each additional oz. or part of oz.	4½ lb.
Postcards—Single ..	5d. each.	8d. each.	—
Reply ...	5d. each half.	8d. each half.	—
Commercial Papers .	5d. first 4 oz., 3d. each additional 4 oz. or part of 4 oz.	5d. first 2 oz., 3d. each additional 2 oz. or part of 2 oz. Min. charge 8d.	4½ lb.
Printed Papers	5d. first 4 oz., 3d. each additional 4 oz. or part of 4 oz.	5d. first 2 oz., 3d. each additional 2 oz. or part of 2 oz.	6½ lb. (single vol. 11 lb.)
Samples	5d. first 2 oz., 3d. each additional 2 oz. or part of 2 oz.	5d. first 2 oz., 3d. each additional 2 oz. or part of 2 oz.	1 lb.
Small Packets (available to certain countries only) ...	5d. for each 2 oz. or part of 2 oz. Minimum charge 2/-.	5d. for each 2 oz. or part of 2 oz. Minimum charge 2/-.	2 lb.
Newspapers, Periodicals and Books, registered at a G.P.O. for transmission as such ..			

NEW ZEALAND AND FIJI ONLY

5d. each 8 oz. or part of 8 oz.
Maximum weight 6½ lb.

AUSTRALIAN AIR MAILS

All classes of postal articles (including parcels) are transmissible by air mail to places within the Commonwealth and its Territories. Enveloped mail not exceeding 10" x 5" x 3/16" in size, posted for delivery within Australia, will be carried by air, free of air mail fees, where air service is available and delivery would be expedited. For other articles, when an "AIR MAIL" envelope is not used, the departmental blue air mail label should be affixed to the top left-hand corner of the article; alternatively, the indication "BY AIR MAIL" may be written prominently in this position. Articles so endorsed, but posted too late for connection by air, will, if such would expedite delivery, be forwarded to their destination by surface mail, except where an article is endorsed "BY AIR MAIL ONLY," in which case it will be held for despatch by the next air mail.

The charges for the transmission of an article by air mail within the Commonwealth are (a) the postage according to the class to which the article belongs; and (b) an air mail fee of 3d. per ounce or portion thereof; e.g., 2-ounce letter, 6d. air mail fee, plus 8d. ordinary postage. Insufficiently prepaid air mail articles for any place within the Commonwealth or its Territories are forwarded by air, irrespective of the deficiency in postage, and surcharged double the amount of the deficiency.

OVERSEAS AIR MAILS

All classes of postal articles are transmissible. The transmission of small packets is restricted to countries which accept such articles in the ordinary post.

Full particulars concerning the conditions applying to the transmission of first and second class mail matter and parcels by air mail, together with details of charges, transit times, and necessary superscriptions, appear in the "Air Mail Schedule," a copy of which may be obtained free at any official Post Office. Alternatively, information may be obtained by telephoning B 040, extension 237.

MONEY ORDERS AND POSTAL NOTES

The Money Order system provides a safe and convenient means of sending money anywhere in Australia or abroad. Commission charged on orders payable in Australia is 1/3d. for each £5 or fraction of £5, and 9d. each additional £5 or fraction of £5. For orders payable in United Kingdom and foreign countries, the rate of commission is 6d. for each £1 or portion of £1 up to £6, with a minimum of 1/3d. POSTAL NOTES in denominations from 1/- to 20/- (poundage from 2d. to 6d.) are available for remitting small amounts within Australia, Papua-New Guinea, and Norfolk Island.

TELEGRAPH SERVICE

RATES WITHIN THE COMMONWEALTH

ORDINARY RATE TELEGRAMS.—Not exceeding 12 words (including address and signature):—

Within a 15-mile radius of the office of origin ..	2/9d.
Beyond a 15-mile radius	3/0d.
Additional word in each case	3d.

URGENT RATE TELEGRAMS.—Urgent rate telegrams are charged at double the ordinary rate, and are treated with the utmost expedition at all stages.

LETTERGRAMS.—24 words or portion thereof 2/0d.
Each additional word 1d.

RATES TO AND FROM COUNTRIES OVERSEAS

British Empire Destinations, excepting as indicated below.

RATES PER WORD:

Ordinary (minimum 5 words)	1/8d.
Letter Telegrams (minimum 22 words)	18/4d.
Each additional word	10d.
Social and Greeting Telegrams (minimum 11 words)	8/4d.
Each additional word	10d.

JOHN LYSAGHT (Australia) LIMITED

SOCIAL LETTER TELEGRAMS are accepted for transmission between places in the Commonwealth and Empire points overseas, with certain minor exceptions. Charges are 8/4 for a minimum of 10 words and 10d. each additional word.

Note.—The service indication "GLT" must appear before the address, but is not charged for.

TELEGRAMS TO AND FROM THE PACIFIC ISLANDS, ETC.—Telegrams may be exchanged between Australia and Islands in the Pacific Ocean such as Fiji, Caroline Island, Cook Islands, Friendly Islands, Gilbert and Ellice Islands, Lord Howe Island, New Caledonia, New Hebrides, Samoa, Society Islands, Solomon Islands, Union Island, Willis Island, New Guinea, Papua, and many other islands adjacent to those mentioned.

RADIO-TELEGRAMS.—Radio-telegrams to ships at sea may be lodged at any Telegraph Office, or telephone subscribers may utilise the phonogram facility to lodge these messages. The rates vary from 9d. to 1/4 per word.

CODE ADDRESSES.—A Code address for telegrams may be registered. For Commonwealth telegrams the charge is £3/3/- per annum; for international telegrams only, £1/1/- yearly; and for both Commonwealth and international telegrams, £3/3/-.

Particulars of a code address and relative full address may be published in the Post Office Guide on payment of a fee of 5/- per annum.

RATES TO NEW ZEALAND.—Telegrams are accepted for transmission to places in New Zealand via cable.

Ordinary Rate (minimum 5 words) 6d. per word

Letter Telegram (minimum 22 words) 5/6d. " "

Each additional word 3d. " "

Social Letter Telegram (GLT):

Minimum 10 words 2/6d. " "

Each additional word 3d. " "

Detailed information regarding overseas telegraph rates may be obtained promptly by calling the Cable Clerk at the G.P.O. Country residents should inquire at the local Post Office.

OTHER OVERSEAS COUNTRIES:

	Per word Min. 5 wds.	LT Min. 22 wds.	Each addl. wd.
Belgium, France, Germany, Italy, Norway, Sweden, Switzerland, Greece, U.S.S.R., Spain	2/6	27/6	1/3
Israel	1/8	18/4	10d.
U.S.A., Netherlands	2/-	22/-	1/-
Japan	3/6	38/6	1/9
South American countries	4/-	44/-	2/-
China, Egypt, Indonesia, Philippines	3/-	33/-	1/6

Refer Overseas Telecommunications Commission (Australia) for further particulars and rates for other destinations.



FIRST AID TO THE INJURED

The following notes of First Aid have been contributed by The St. John Ambulance Association, of St. John House, 21 Macquarie Place, Sydney, the recognised teachers of First Aid, and have been taken from the St. John Manual, "First Aid to the Injured."

In all cases of illness or accident first send for a doctor or ambulance, notifying them clearly of the case to be treated and location of the accident.

FIRST AID KIT.—It is recommended that every home be equipped with an adequate First Aid Kit, the suggested contents for which are:—

Dressings: Bandages 1" and 2", broad bandage, cotton wool, lint, sling, gauze. Suggest cutting lint and gauze into 2" x 2" strips, placing each in a clean rag (to be sewn up) and sterilise by baking in the oven one hour.

Iodine (tincture).

Castor Oil.

Soda Bicarb.

Condy's Crystals.

Sal volatile.

SHOCK.—All cases of accident or sudden illness result in a condition known as Shock, which must be treated primarily.

TREATMENT OF SHOCK.—Lay patient on his back, loosen clothing about the neck, chest, and waist, and ensure a free circulation of air. Keep patient warm by covering with coats and blankets, but do not overheat the patient. When able to swallow, give strong tea or coffee with plenty of sugar, or milk as hot as can be drank.

Hæmorrhage (Bleeding—General Rules for Treatment)

Place patient in suitable position. Elevate bleeding part except in the case of broken limb. Expose wound, removing only whatever clothing is necessary. Remove any visible and easily removed foreign bodies. All others are left severely alone. When bleeding has stopped keep the patient warm. Give plenty of fluids, especially warm tea or water with sugar if available.

SCALP.—Apply small firm pad on the wound, securing it by a narrow bandage.

NECK.—Apply thumb of one hand on the artery, pressing backwards against the spine, taking care to avoid windpipe.

FACE.—Below the level of the eye. Apply direct pressure on the wound from the outside of the cheek against the jawbone.

ARMPIT.—Place hard pad (size of billiard ball) in the armpit. Apply centre of narrow bandage on the pad, cross the bandage on shoulder, pull the ends tight, and tie under the opposite armpit.

UPPER ARM.—Apply pressure with fingers on the artery by grasping the arm at its centre from behind and compress the artery against the bone.

FOREARM.—Pressure may be applied by the thumb placed on either of the pulsating arteries (according to the side of the arm the wound occurs).

PALM OF HAND.—When foreign body or broken bone is not present, apply dressing and firm pad, making the patient grasp it. Bandage hand.

FINGERS.—Apply small pad on wound and secure firmly with bandage.

THIGH.—Place thumbs one on the other on the pulsating artery at the centre of the groin, grasping the thigh with hands. When wound occurs in upper region of artery, keep the pressure up until the arrival of doctor. Each fresh assistant places his thumbs over those of his predecessor, who slips his away, and thus gushes of blood are prevented during the change.

LEG.—Front or back: Apply pressure by fingers or pad if bleeding at the ankle and bandage on pulsating arteries on front (below knee) and back (halfway down leg) of leg if hæmorrhage occurs there.

SOLE OF FOOT.—Apply dressing and firm pad over the bleeding point, and maintain firm pressure by bandaging. Support foot in an elevated position.

ANTISEPTICS.—In wounds and on the skin, no antiseptics which burn or irritate should be used. When prepared antiseptics are not available, normal saline solution (one teaspoonful of common salt to one pint of sterile water) should be used.

If sterilised dressings are not available, sterilise the fingers, cut piece of clean gauze, lint, or boracic lint to required size and apply to wound. Dressing should be covered with cotton wool and kept in place with bandage.

COLD COMPRESS.—Used to ease pain, lessen swelling, control internal bleeding. A clean handkerchief or piece of lint is soaked in cold water and applied to affected part. Change frequently.

HOT COMPRESS.—Used to ease pain. Piece of flannel or lint soaked in very hot water and wrung dry and shaken to expel steam and applied to affected part.

Fractures (Broken Bones)—Signs and Symptoms

Pain at or near seat of fracture; loss of power in the limb; swelling about the seat of fracture; deformity of limb; unnatural mobility.

TREATMENT.—Attend to fracture on spot. No attempt must be made to move patient until limb has been rendered immovable as practicable by splints or other means of restraint. Steady and support injured limb, placing it in as natural position as possible. Apply splints and bandages.

SPLINTS.—These may be improvised from walking sticks, umbrellas, broom handles, rifles, folded coats, pieces of wood, or other similar objects. When splints are not available, tie fractured limb to the body, and in all cases a fractured lower limb should be bandaged to its fellow.

FRACTURED SKULL.—Apply ice or cold water to head continuously, keeping patient absolutely quiet in a darkened room. Promote warmth to lower part of the body by applying hot water bottles to the sides of the abdomen and lower limbs.

LOWER JAW.—Place palm of hand below injured bone and press it gently against the upper jaw, applying bandage under the chin, carrying both ends upward and tying above the head.

COLLAR BONE.—Place pad about 2" thick in armpit. Place arm in sling; secure injured limb firmly to the side by broad bandage passed round elbow and trunk.

RIBS.—Apply two broad bandages or strong towel folded about 8" wide firmly round the chest, securing with three or four safety pins on side opposite to the injury.

FOREARM.—Apply splints on the front and back of forearm from elbow to fingers, unless there is a wound at the site of injury. Bandage above fracture and around the wrist. Place arm in sling.

UPPER ARM.—Near shoulder: Apply broad bandage with upper border level with top of shoulder; pass it round the limb and body and tie on opposite side under armpit.

Middle of shaft: Apply splints from shoulder to elbow in front and back and outer side of arm. Secure splints by bandages above and below fracture.

HAND.—Apply carefully padded splint to front of hand and secure by bandage.

THIGH.—Apply bandage around ankles and feet; place splint along injured side from armpit to beyond the foot; secure with bandages.

LEG.—Apply splints on outer and inner side of leg and secure by bandages. When no splints are available, tie feet, ankles, knees, and thighs together.

CRUSHED FOOT.—Apply carefully padded splint to sole of foot from heel to toes and secure with bandages.

General

DISLOCATION OF JOINTS.—Steady and support limb in most comfortable position. Apply cold compresses to relieve pain. Do not attempt to reduce dislocation.

SPRAINS.—Support the injured part and apply hot compresses.

RUPTURE (HERNIA).—Lay patient down, raise and support head and shoulders; bend the knees and place pillow under them. Apply ice or cold compress to affected part. Make no attempt to reduce swelling.

BURNS AND SCALDS.—Do not remove clothes, and do not break away any blisters. Saturate area with warm alkaline solution (1 dessertspoon baking soda to 1 pint warm water) or warm saline solution (1 teaspoonful common salt to 1 pint warm water). Cover area with lint, gauze or linen soaked in similar solution. Bandage firmly in position. Give large quantities of warm, weak, sweet tea.

FOREIGN BODY IN EYEBALL.—Do not attempt to remove. Drop medicinal paraffin or castor oil on eyeball after pulling down lower lid. Close the lids, apply soft pad of cotton wool, and secure by bandage.

QUICKLIME OR OTHER CORROSIVE ALKALI IN EYE.—Bathe the eye with solution of vinegar and cold water (1 part in 4) and treat as for the foreign body. If vinegar is not available, wash freely with cold water.

CORROSIVE ACID IN THE EYE.—Bathe the eye with solution of baking soda (1 dessertspoonful in pint of cold water) and treat as for foreign body.

FOREIGN BODY IN EAR CHANNEL.—Fill ear with olive oil, when insect will float and may be removed. Do not probe or syringe the ear.

FOREIGN BODY IN NOSE.—Instruct patient to breathe through the mouth. Seek medical aid at once.

SUNSTROKE.—Sponge body with cold water continuously. Apply ice bags to head and spine; fan vigorously. Give Epsom or Glauber Salts (1 tablespoon to tumbler of water). Place patient in cool spot.

APOPLEXY (STROKE).—Apply ice or cold water to head continuously; apply hot water bottles to lower limbs and feet. If face flushed, raise head, loosen clothing.

FAINTING.—Sprinkle face with hot and cold water alternately; apply warmth to pit of stomach and over the heart. Loosen all clothing, give air.

BITES.—Snake Bite, Spider Bite.—Immediately arrest circulation in limb by means of constriction on limb between the wound and the heart on the upper arm or thigh (as the case may be). Release constriction after 20 minutes, immediately replacing it. Give hot drinks, such as strong coffee, tea, or milk. Encourage bleeding by scarifying puncture marks. If available, rub in Condy's crystals.

Poisons

EMETIC.—To make patient vomit:—

1. Mustard powder—a tablespoonful in a tumblerful ($\frac{1}{2}$ pint) of lukewarm water, or
2. Salt—two tablespoonsful in a tumblerful ($\frac{1}{2}$ pint) of lukewarm water.

POISONS.—Except when lips and mouth are burned, promptly give an EMETIC.

When lips and mouth are burned, DO NOT give an emetic, but give the following antidotes:—

If an acid is known to be the poison, give one of the following alkalis:—Lime-water in large quantities or 1 tablespoonful of whitening, chalk, or magnesia in $\frac{1}{2}$ pint of water, repeated frequently, or carb. soda.

If an alkali is known to be the poison, give one of the following acids:—Vinegar or lemon juice or lime juice, each diluted with an equal quantity of water, by the tumblerful.

If these antidotes are not readily available, or if it is not known whether the corrosive poison is an acid or alkali, give copious draughts of cold water or milk.

CARBOLIC ACID (PHENOL) AND LYSOL POISONS.—Give $\frac{1}{2}$ pint of medicinal paraffin or Epsom or Glauber Salts, 1 tablespoonful in tumbler of milk or water.

IODINE POISON.—Before the emetic give starch and water freely or thin cornflour or arrowroot.

PHOSPHORUS.—Give Epsom or Glauber Salts, 1 tablespoonful in a tumblerful of water. Oil or fat in any form must not be given.

ALCOHOL.—Promote warmth of the body, ensure rest and shelter; adopt general rules which apply; give strong coffee.

STRYCHNINE (contained in many vermin killers).—Between the convulsions give an emetic and perform artificial respiration. Adopt the general rules which apply.

PRUSSIC ACID AND CYANIDE OF POTASSIUM.—Not a moment should be lost in carrying out treatment. Apply artificial respiration even if breathing has not ceased. If patient can swallow, give freely brandy, whisky, or sal volatile diluted with an equal quantity of water. Dash cold water on head and spine continuously. Adopt the general rules which apply.

Artificial Respiration for Mild Asphyxiation, Electric Shock, Drowning, etc.

SCHAFER'S METHOD.—At once place the patient face downwards with arms extended above the head and head turned to one side so as to keep the nose and mouth away from the ground. Do not waste time loosening clothing; no pad is to be placed under the patient, nor need the tongue be drawn out. Kneel at one side of the patient, facing his head and sitting on your heels. Place your hands on the small of the patient's back, their lower edges just clearing the top of the pelvis, the wrists nearly touching, the thumbs as near each other as possible without strain, and the fingers passing over the loins on either side and pointing towards the ground. Bending your body from the knees and somewhat straightening the hip joints, swing slowly forward, keeping your arms quite straight and rigid. Swing your body slowly backwards to its first position. Alternate these movements by a rhythmic swaying forwards and backwards of your body from the knee joints, twelve times a minute. Rhythm is—pressure two seconds and relaxation three seconds. When natural breathing begins, regulate the movements of artificial respiration to correspond with it, and promote circulation by rubbing the limbs vigorously towards the heart and applying warmth. Artificial respiration must be continued perseveringly until respiration is restored or until a doctor pronounces life to be extinct.

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The above are brief notes only on First Aid. It is strongly recommended that classes in First Aid and Home Nursing be attended so as to give members of a household a thorough knowledge of how to render First Aid in case of accident and the care of sick persons in the home. Branches of the St. John Ambulance Association are in existence at Ambulance Stations in all country towns. Enquiries are welcomed by the Head Office of the Association, 21 Macquarie Place, Sydney.

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