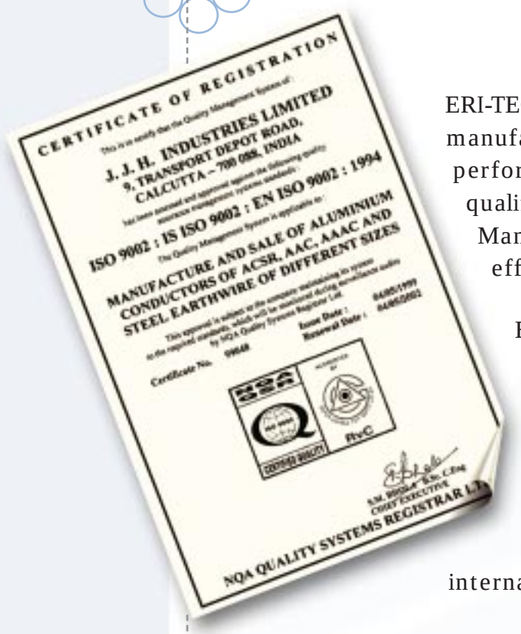
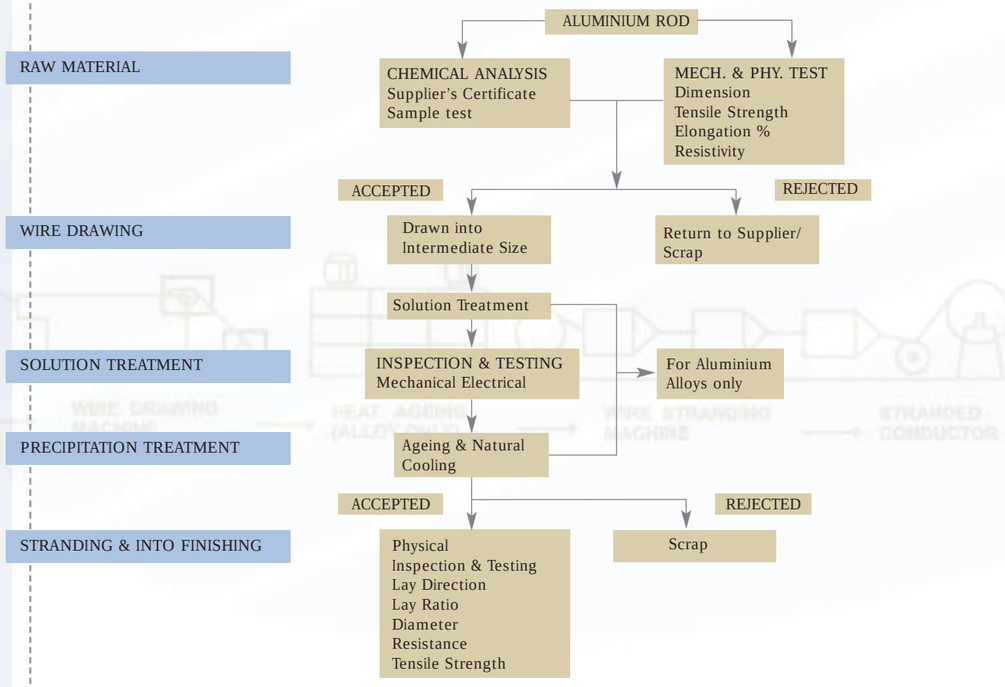


ERI-TECH, formerly JJH, is an ISO Certified manufacturer of high repute on quality & performance. The Company is managed by highly qualified technicians & professionally competent Managers to sustain the high standards of efficiency & quality standards.

Eri-tech (renamed from JJH) is among the few Indian Companies which have 45 year existence in conductor manufacture and is also supported with an **ISO Certification.**

We endeavour to take qualities to newer heights in order to meet all international norms.

AAAC MANUFACTURING FLOW CHART

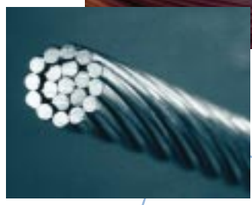


FOREWORD

The company was setup in the year 1957 for the manufacture of AAC & ACSR Conductors to meet the growing needs of electrical utilities of independent India.

With passage of time and in order to cater to the demand of regional electricity utilities, the Company diversified into manufacture of AAAC Conductors, ACAR, ACSR-AS, Copper and Galvanised Steel Earthwire / Staywires.

Today, the Company's products find wider usage both for National and International Transmission & Distribution Lines.

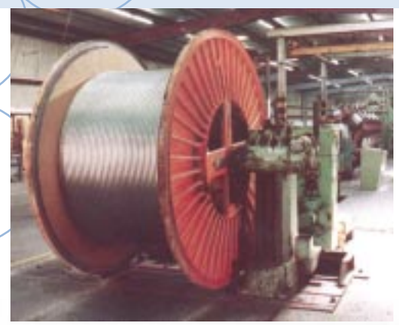


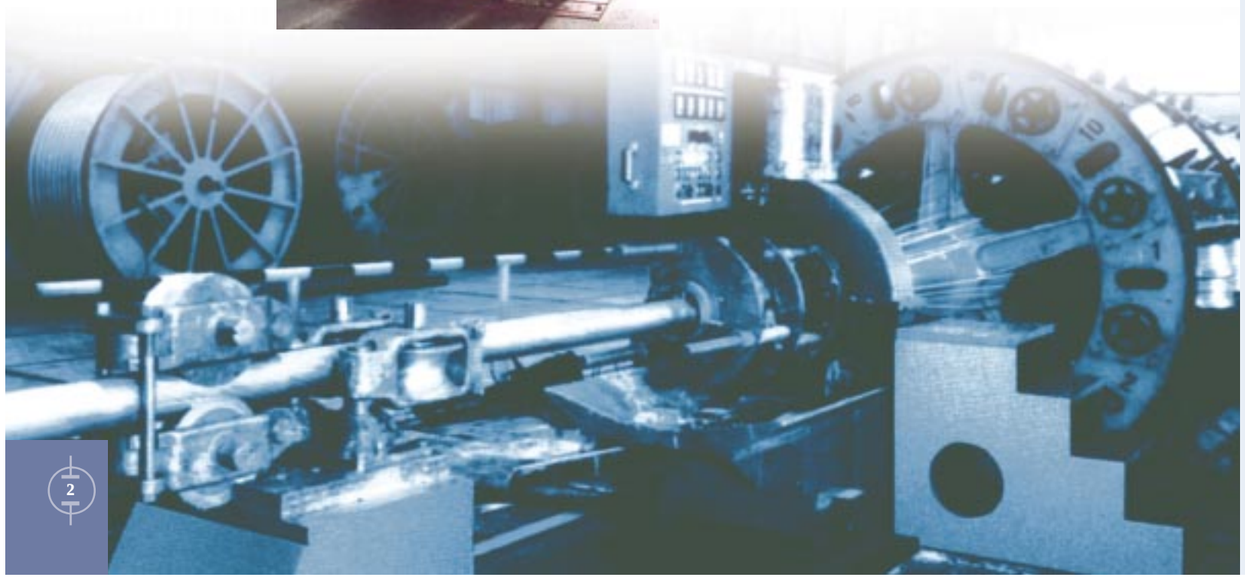
MANUFACTURING

Aluminium or copper wires are drawn from high conductivity wire rods and then stranded in high speed stranders for 7, 12, 18, 24 layers of wires, one over the other. The configuration of Conductors manufactured will vary according to the requirements of the customer.

Aluminium alloy based conductors being AAAC, AAASR, ACAR types are solution treated and aged in speciality furnaces to achieve the perfect match of high mechanical strength and electrical conductivity.

The finished conductors are supplied in stranded forms as per the length specified by the buyers. We strongly recommend use of steel fabricated drums for convenient shipping & longer life coupled to reusability. Normally we will recommend for each customer order, the length that is layered onto each drum. Wooden drums can also be supplied if so specified by the buyer.





Eri-Tech has been renamed from JJH Industries Ltd., who have possessed all the requisite know how and test conformity certificates from renowned consultant & laboratories.

QUALITY CONTROL AND R & D

The quality control wing of the Company is alive to the need of exacting and precise standards to ensure a high level of quality assurance. Due care is exercised in raw material selection at different stages of the production process, each step of which is adapted to have inbuilt quality that will stand severe field conditions.

In-house control facilities include tests, e.g. Mechanical, Physical, Chemical analysis, Electrical Resistance & Temperature Rise.

In addition, microstrain analysis of stresses on a vibrating conductor at varying frequencies and amplitudes is derived on a 40 metre span in our own laboratory, where line conditions are simulated.

Apart from usual in-house tests, world approved laboratories have approved the conductors for Stress-Strain & Surface conditions, Radio Noise levels, Visible discharge / Corona loss measurements.

RESEARCH & DEVELOPMENT

Evolves product design

Defines specifications
- For Manufacture
- For Process Control

Defines testing procedures

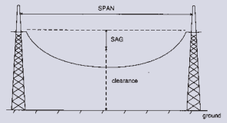
Production Department
- Uses specified equipment
- Adopts specified manufacturing procedure
- Will assure performance of product

Quality Assurance

Assures full compliance to user specification by
- Guaranteeing required quality levels
- Adhering to all specification
  – For procedures on test
  – For procedures on controls
- Assures that all control facilities have been regularly calibrated.

Catenary curve

An overhead conductor suspended between towers assumes the shape of a catenary curve. Usually, it is convenient without consequent error, to regard the curve as a parabola.



The sag f and the span P are given by the formula :

$$f = \frac{0.981\ mp^2}{8\ T} \quad (1)$$

With f = sag (m)
m = linear mass of conductor (kg/m)
P = span (m)
T = load ont he conductor (daN)

examp: AAC ASTER 570
Span 550 m
Sag 12 m
determine the load on the conductor T

$$f = \frac{0.981\ m\ P2}{8f}$$

m = 1.574 kg/m

$$T = \frac{0.981 \times 1.574}{8.12} = 4021\ daN$$

The rating tensile strength of ASTER 570 is 18 360 daN. in these conditions, the conductor is loaded on 21.9% of its rated tensile strength.

(*) heat due to Foucault' effect is negligible.

Variations of load with the sag is given for this conductor in the table :
ASTER 570 – Span = 500 m

f(m)	3	4	5	6
T (daN)	16084	12063	9650	8042

f(m)	7	8	9	10	20
T (daN)	6893	6031	5361	4825	2412

The less the sag, the greater the load on the conductor.
Length of the conductor
Between the towers, the length of the conductor L(m) is given by the formula :

$$L = P + \frac{8f2}{3P}$$

Span P = 500 m
Sag f = 12 m

L = 500,766

Caution :
For an installation with a Single span of a conductor, you need a length of conductor of L+300 m and the 300 m will be lost (dead length).

Variations of sag with weather conditions

Some factors increase the sag after initial stringing :
– Thermal expansion of the conductor because of increased temperature above that during stringing.
– Increase of conductor apparent weight because of wind, ice load, and so on.
– Creep of conductor.

The line designer must consider all these factors to determine initial sag and so, to respect the minimum clearance between the conductor and the ground.

Every day stress (E.D.S.)

This is the load on the conductor, every day This load expressed in percentage of rated tensile strength of the conductor.
Weather condition are :
Temperature T = 15OC
Wind V = 0
To write EDS = 20% explains that, at 15°C without wind, the load on the conductor is equal to 20% of the rated tensile strength.

example : ASTER 570
Rated tensile strength = 18360 daN
Temperature = 15OC
Without wind
Span = 500 m
EDS = 20%
T = 18360 x 0.20 = 3672 daN

$$f = \frac{0.981\ m\ P2}{8\ T}$$

$$f = \frac{0.981 \times 1{,}574 \times (500)2}{8 \times 3672} = 13.14\,m$$

In a span of 500 m length, an ASTER 570 conductor with a sag of 13.14 m, at 15°C without wind, has an EDS of 20%.

Parameter

This is the parameter of the geometric curve of the conductor, the coefficient of the catenary equation.
Its expression is given by

$$Pa = \frac{p^2}{8\ f} \quad (2)$$

Pa = Parameter (m)
P = Span (m)
f = Sag (m)

examp : ASTER 570
P = 500 m–
f = 13.14 m.

$$Pa = \frac{(500)2}{8 \times 13.14}\ 2378\ m$$

Parameter is : 2378 m
When the parameter is known, sag is calculated with (2) and load with (1).

safety factors

The safety factor is the ratio between the rated tensile strength of conductor and the effective load on conductor overloaded by wind and ice.

Each country has established specific weather conditions to determine the safety factors.

In India, for instance, the safety factor is generally 2.5

To avoid vibrations, it is generally preferred to load a conductor at average temperature without wind, on 16 to 22% of its rated tensile strength.

INTRODUCTION TO OVERHEAD CONDUCTORS

In the line design process, the most crucial decision often involves selecting the phase and ground conductors. Conductors usually comprise 30% of the material and labour costs of a line. The selection of conductors is critical since the wind and tension loads that supporting structures must withstand are dependent on the size and type of conductors used.

Phase and ground conductors normally consist of multiple strands of aluminium, copper, and/or steel. Due to the stranding induced helical form of the individual strands, conductors exhibit lower composite rated breaking strength (4 to 11%), greater weight and higher resistance per unit length of conductor (2 to 4%) than would be obtained, were all the component wires parallel alone.

Selection of the conductor depends upon factors, such as power requirements, terrain, ambient conditions, cost of the conductor and supporting structures, governmental and environmental constraints, strength and electrical resistance, stress-strain relationship, thermal characteristics and inductive and capacitive reactances. Array of conductors ranging standard AAC, AAAC, ACAR and ACSR have been developed to meet the varying needs of the electrical utility engineer.

CONDUCTOR MATERIALS

The most common type of phase conductors for overhead transmission lines is composed of strands of relatively pure aluminium ; an aluminium alloy, and steel combined. Copper conductors are rarely used today because of their inferior conductivity-to-weight and strength-to-weight ratios and high costs.

Copper	Strands of Copper
ACSR	Strands of aluminium with steel core
AAC	Strands of Aluminium
AAAC	Strands of Alloy Aluminium
ACAR	Strands of Aluminium, Aluminium alloy reinforced
AAASR	Strands of Aluminium alloy, steel reinforced.
GSW	Strands of Galvanised Steel

Thermal Rating of Overhead Conductors

General

The major consideration involving the ampacity of transmission conductors is the effect of conductor heating by the current (Joule effect) and the consequent reduction of tensile properties.

Heating to high temperatures for long periods anneals aluminium and aluminium alloys and reduces the tensile strength of conductors.

Each country has established general rules for climatic conditions :
– Ambient temperature – summer
– winter
– Velocity of wind
– Solar energy and for maximum heating of conductors :
– Maximum temperature rise
– Emergency conditions during fault process.

Heat balance

Temperature rise in a conductor depends on the balance between heat input ($R1^2$ + heat received from sunshine) and heat output (due to radiation from the conductor surface and transfer because of convection air currents).

The factors of importance that ampacity for a given temperature are wind velocity, conductor surface emissivity, atmospheric pressure, and of course the ambient temperature.

General equation

To determine the ampacity of a conductor, it is necessary to know the following conditions :

Weather conditions

– Velocity of wind	v (m/s)
– Intensity of solar radiation	Si (W/m^2)
– Ambient temperature	T_1 (^oC)
– Maximum temperature of conductor in permanent state	T_2 (^oC)

Conductor characteristics

– Diameter of conductor	d (mm)
– Nature of metal conductor (pure aluminium or alloy)	
– Constant mass temperature coefficient of resistance	K (/^oC)
– Linear resistance per km at 20^oC	R (ohm/km)
– Coefficient of solar absorption	a (0.5 usually)
– Emissivity power ratio to black body	e (0.6 usually)

ø = Stefan constant = 5.7×10^{-8}

The general equation is :

$$1^2 = \frac{8550\,(T_2-T_1)(v.d. \times 10^{-3})^{0.448} + e.\text{ø}\,\pi\, d[(T_2+273)^4-(T_1+273)^4]-a\,Sid \quad (1)}{R\,[\,1+K\,(T_2-20\,)\,]}$$

with simplifications :

$$1^2 = \frac{8550\,(T_2-T_1)(v.d. \times 10^{-3})^{0.448} + 1.075 \times 10^{-7d}\,[(T_2+273)^4-(T_1+273)^4]-a\,Sid \quad (2)}{R\,[\,1+K\,(T_2-20\,)\,]}$$

Example

AAC ASTER 570 d = 31.05mm
C 34125 R = 0.0583 ohm/km
K = 0.00360
Al.Mg.Si alloy
(table 1)

weather conditions
and rating conditions

– Velocity of wind v = 1 m/s
– Intensity of solar radiation Si = 900 W/m^2
– Ambient temperature T_1 = 10^oC
– Equilibrium temperature T_2 = 60^oC

The use of mini-computer gives
(equation 2) I = 1200A

Conductor Selection

Tension loads, wind loads, the current loading of the line , voltage stability, environmental effects, electrical losses, ambient conditions are all factors which must be considered to select a conductor. Selection should exemplify the best conductivity-to-weight ratio and/or strength-to-weight ratio at a minimal cost for the application. The electrical and mechanical properties, thermal properties, and stress-strain relationship of the conductor will dictate the choice of conductor type and size for a given design.

In short, there may be conductors which offer some advantages in a particular line condition corresponding to other. Power line engineer should drive a balance between the advantages vis a vis needs of the line design. The following factors should be considered.

- Lower electrical resistance resulting in higher conductivity
- Lower thermal elongation resulting in less sag
- Higher annealing temperatures allowing greater ampacity
- Superior tensile strength for larger spans and lower creep
- Superior corrosion resistance to withstand all weather conditions
- Lower weight to strength ratios
- Capacity to withstand ice loading & wind induced aeolian violations.
- Suitability for urban or rural usages.

ELECTRICAL AND PHYSICAL CONSTANTS
Characteristics

	Annealed Copper	Commer-cial copper	Hard drawn aluminium	Aluminium magnesium silicon alloy	Zinc coated steel
Conductivity (% IACS)	> 100	> 97	> 61	> 53	
Resistivity at 20^{o}C (ohm mm2/m)	0.01724	0.01771	0.02826	0.0325	–
Volumic mass at 20^{o}C(g/cm2)	8.89	8.89	2.703	2.703	7.78
Constant mass temperature-Coefficient of resistance (/OC)	0.00393	0.00381	0.00403	0.00360	–
Coefficient of linear expansion (/OC)	17.0x10-6	17.0x10-6	23.0x10-6	23.0x10-6	11.5x10-6
Final modulus of elasticity (M Pa)	100 000	125 000	70 000	70 000	196 000

AAC (HAL)

Japanese Industrial Standard - JIS C 3109 (1978)

Conductor size mm2	Stranding No./mm	Calculated sectional area mm2	Overall diameter mm	Weight kg/km	Ultimate strength kg	Electrical resistance ohm/km
30	7/2.3	29.09	6.9	79.48	469	0.983
38	7/2.6	37.16	7.8	101.5	576	0.769
55	7/3.2	56.29	9.6	153.8	838	0.507
95	7/4.2	96.95	12.6	264.9	1,410	0.295
150	19/3.2	152.8	16.0	418.7	2,270	0.188
200	19/3.7	204.3	18.5	559.8	3,040	0.140
240	19/4.0	238.8	20.0	654.5	3,470	0.120
300	37/3.2	297.6	22.4	820.1	4,430	0.0969
400	37/3.7	397.8	25.9	1,097	5,930	0.0726
510	37/4.2	512.5	29.4	1,413	7,460	0.0563
660	61/3.7	655.8	33.3	1,812	9,770	0.0441
850	61/4.2	844.9	37.8	2,334	12,300	0.0342
980	91/3.7	978.3	40.7	2,716	14,580	0.0297
1,260	91/4.2	1,260	46.2	3,499	18,350	0.0230

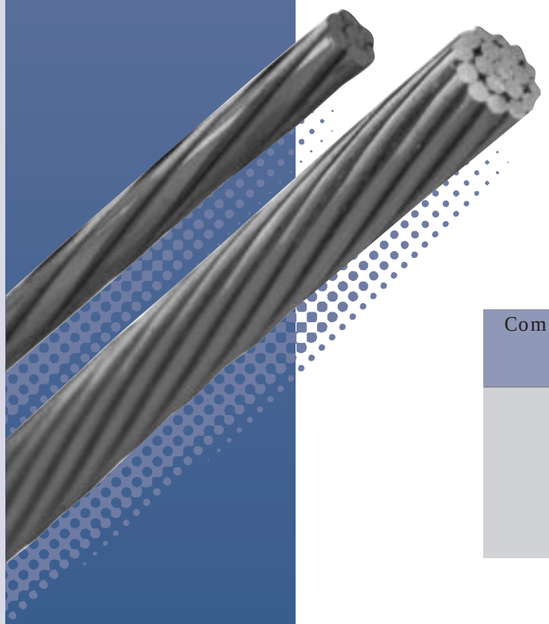
AAC

DIN 48201 Blatt 5 - 1965

Conductor size mm2	Stranding No./mm	Calculated sectional area mm2	Overall diameter mm	Ultimate strength kP	Weight kg/km kg	Calculated electrical resistance at 20°C ohm/km
16	7/1.7	15.89	5.1	290	44	1.798
25	7/2.1	24.25	6.3	425	67	1.177
35	7/2.5	34.36	7.5	585	94	0.831
50	7/3	49.48	9	810	135	0.577
50	19/1.8	48.36	9	860	133	0.596
70	19/2.1	65.82	10.5	1,150	181	0.438
95	19/2.5	93.27	12.5	1,595	256	0.309
120	19/2.8	117.0	14	1,910	322	0.246
150	37/2.25	147.1	15.7	2,570	406	0.197
185	37/2.5	181.6	17.5	3,105	501	0.160
240	61/2.25	242.5	20.2	4,015	670	0.120
300	61/2.5	299.4	22.5	4,850	827	0.0969
400	61/2.89	400.1	26	6,190	1,105	0.0730
500	61/3.23	499.8	29.1	7,600	1,381	0.0580
625	91/2.96	626.2	32.6	9,690	1,733	0.0462
800	91/3.35	802.1	36.8	12,055	2,219	0.0361
1,000	91/3.74	999.7	41.1	14,845	2,766	0.0290

AAC

ALL ALUMINIUM CONDUCTOR



Characteristics

- Wires of same diameters stranded in concentric layers
- Offers higher amperage with least losses
- Suited as bus bars for substations
- Specially suited for urban areas applications
- Ideal for all types of insulations and coverings
- Economically viable as compared to Copper Conductors
- Ideal for PVC insulated cables in urban areas

Composition	Final modulus of elasticity Mpa	Coefficient of linear expansion / °C
7	60000	$23.0x10^{-6}$
19	57000	$23.0x10^{-6}$
37	57000	$23.0x10^{-6}$
61	54000	$23.0x10^{-6}$

AAC

ASTM B231-81

Conductor Code Word	Conductor Size CM or AWG	Stranding Nos./mm	Sectional area mm^2	Overall diameter mm	Weight kg/mm	Ultimate strength kg.	Calculated DC resistance at 20°C ohm/km	Class	
								AA	A
Bluebonnet	3,500,000	127/4.216	1,773	54.81	4,983	26,700	0.01653	–	0
Trillium	3,000,000	127/3.904	1,520	50.75	4,274	22,800	0.01927	–	0
Bitterroot	2,750,000	91/4.415	1,393	48.57	3,879	20,900	0.02083	–	0
Lupine	2,500,000	91/4.209	1,266	46.30	3,525	19,000	0.02292	–	0
Sagebrush	2,250,000	91/3.993	1,139	43.92	3,173	17,100	0.02547	–	0
Cowslip	2,000,000	91/3.764	1,013	41.40	2,819	15,600	0.02866	–	0
Jessamine	1,750,000	61/4.303	886.9	38.73	2,446	13,500	0.03239	0	–
Coreopsis	1,590,000	61/4.100	805.2	36.90	2,221	12,200	0.03568	0	–
Gladiolus	1,510,500	61/4.998	765.6	35.98	2,111	11,600	0.03752	0	0
Carnation	1,431,000	61/3.891	725.3	35.02	2,000	11,000	0.03961	0	0
Columbine	1,351,500	61/3.780	684.4	34.02	1,887	10,600	0.04197	0	0
Narcissus	1,272,000	61/3.668	644.8	33.01	1,777	9,900	0.04458	0	0
Hawthorn	1,192,500	61/3.551	604.1	31.96	1,665	9,550	0.04757	0	0
Marigold	1,113,000	61/3.432	564.3	30.89	1,556	8,950	0.05092	0	0
Bluebeli	1,033,500	37/4.244	523.6	29.71	1,443	8,050	0.05489	0	–
Larkspur	1,033,500	61/3.307	523.9	29.76	1,445	8,290	0.05485	–	0
Hawkweek	1,000,000	37/4.176	506.9	29.23	1,397	7,780	0.05671	0	–
Camellia	1,000,000	61/3.251	506.4	29.26	1,396	8,020	0.05675	–	0
Magnolia	954,000	37/4.079	483.6	28.55	1,333	7,410	0.05944	0	–
Goldenrod	954,000	61/3.178	483.9	28.60	1,334	7,630	0.05939	–	0
Cockscomb	900,000	37/3.962	456.2	27.73	1,257	7,000	0.06299	0	–
Snapdragon	900,000	61/3.086	456.3	27.77	1,258	7,190	0.06297	–	0
Arbutus	795,000	37/3.724	402.9	26.07	1,111	6,330	0.07129	0	–
Lilac	795,000	61/2.901	403.2	26.11	1,112	6,480	0.07127	–	0
Petunia	750,000	37/3.617	380.4	25.32	1,048	5,960	0.07559	0	–
Cattail	750,000	61/2.817	380.2	25.35	1,048	6,150	0.07558	–	0
Violet	715,500	37/3.533	362.7	24.73	1,000	5,790	0.07923	0	–
Nasturtium	715,500	61/2.751	362.6	24.76	999.9	5,980	0.07926	–	0
Verbena	700,000	37/3.493	354.6	24.45	977.5	5,660	0.08105	0	–
Flag	700,000	61/2.720	354.5	24.48	977.5	5,820	0.08106	–	0
Heuchera	650,000	37/3.368	329.6	23.58	908.8	5,290	0.08717	0	–
Orchid	636,000	37/3.330	322.2	23.31	888.4	5,150	0.08918	0	0
Meadowsweet	600,000	37/3.233	303.7	22.63	837.5	4,850	0.09461	0	0
Dahila	556,500	19/4.346	281.8	21.73	777.1	4,420	0.1019	0	–
Mistletoe	556,500	37/3.114	281.8	21.80	777.1	4,510	0.1020	0	0
Zinnia	500,000	19/4.120	253.3	20.60	698.5	3,980	0.1134	0	–
Hyacinth	500,000	37/2.951	253.1	20.66	697.8	4,140	0.1136	–	0
Cosmos	477,000	19/4.023	241.5	20.12	665.9	3,780	0.1190	0	–
Syringa	477,000	37/2.883	241.5	20.18	666.1	3,940	0.1190	–	0
Goldentuft	450,000	19/3.909	228.0	19.55	628.7	3,570	0.1260	0	–
Canna	397,500	19/3.675	201.6	18.38	555.6	3,230	0.1426	0	0
Daffodil	350,000	19/3.447	177.3	17.24	488.8	2,900	0.1621	–	0
Tulip	336,400	19/3.381	170.6	16.91	470.4	2,790	0.1685	–	0
Peony	300,000	19/3.193	152.1	15.97	419.4	2,490	0.1889	–	0
Daisy	266,800	7/4.961	135.3	14.88	373.1	2,190	0.2123	0	–
Laurel	266,800	19/3.010	135.2	15.05	372.7	2,260	0.2125	–	0
Sneezewort	250,000	7/4.801	126.7	14.40	349.4	2,050	0.2267	0	–
Valerian	250,000	19/2.913	126.6	14.57	349.0	2,100	0.2269	–	0
Oxlkip	(4/0)	7/4.417	107.2	13.25	295.7	1,740	0.2680	0	0
Phlox	(3/0)	7/3.932	84.98	11.80	234.3	1,380	0.3381	0	0
Aster	(2/0)	7/3.503	67.47	10.51	186.0	1,140	0.4259	0	0
Poppy	(1/0)	7/3.119	53.48	9.357	147.4	900	0.5372	0	0
Pansy	(–1)	7/2.776	42.36	8.328	116.8	746	0.6783	0	0
Iris	(– 2)	7/2.474	33.65	7.422	92.75	614	0.8539	0	0
Rose	(– 4)	7/1.961	21.14	5.883	58.29	400	1.359	0	–
Peachbell	(– 6)	7/1.554	13.28	4.662	36.61	255	2.164	0	–

AAC

BS 215 : Part : 1970

Code word	Conductor size mm^2	Stranding No./mm	Calculated sectional area mm^2	Overall diameter mm	Weight kg/km	Ultimate Strength		Calculated electrical resistance at 20°C ohm/km
						kN	kg	
Midge	22	7/2.06	23.33	6.18	64	3.99	407	1,227
Ant	50	7/3.10	52.83	9.30	145	8.28	844	0.5419
Fly	60	7/3.40	63.55	10.20	174	9.90	1,010	0.4505
Wasp	100	7/4.39	106.0	13.17	290	16.00	1,630	0.2702
Hornet	150	19/3.25	157.6	16.25	434	25.70	2,620	0.1825
Chafer	200	19/3.78	213.2	18.90	587	32.40	3,300	0.1349
Cockroach	250	19/4.22	265.7	21.10	731	40.40	4,120	0.1083
Butterfly	300	19/4.65	322.7	23.25	868	48.75	4,976	0.08916
Centipede	400	37/3.78	415.2	26.46	1,145	63.10	6,430	0.06944

Note : 1kN = 100,000,000 dyne = 101.92 kgf.

AAC

CSA C-49 1965

Code word	Conductor size CM or AWG	Stranding No./mm	Calculated sectional area mm2	Overall diameter mm	Weight kg/km	Ultimate strength kg	Calculated electrical resistance at 20°C ohm/km
Rose	(4)	7/1.96	21.12	5.88	57.83	416	1.356
Lily	(3)	7/2.20	26.61	6.60	72.82	515	1.076
Iris	(2)	7/2.47	33.54	7.41	91.83	637	0.8535
Pansy	(1)	7/2.78	42.49	8.34	116.4	777	0.6738
Poppy	(1/0)	7/3.12	53.52	9.36	146.5	938	0.535
Aster	(2/0)	7/3.50	67.35	10.50	184.4	1,180	0.4252
Phlox	(3/0)	7/3.93	84.91	11.79	232.5	1,440	0.3372
Oxlip	(4/0)	7/4.42	107.4	13.26	294.0	1,810	0.2667
Valerian	250,000	19/2.91	126.4	14.55	374.6	2,260	0.2277
Laurel	266,800	19/3.01	135.2	15.05	371.9	2,430	0.2128
Peony	300,000	19/3.19	151.2	15.95	417.8	2,660	0.1895
Tulip	336,400	19/3.38	170.5	16.90	469.0	3,000	0.1688
Daffodil	350,000	19/3.45	177.6	17.25	488.8	3,120	0.162
–	400,000	19/3.69	203.1	18.45	559.0	3,500	0.1417
Coldentuft	450,000	19/3.91	228.2	19.55	627.8	3,860	0.1261
Cosmos	477,000	19/4.02	241.1	20.10	663.4	4,070	0.1193
Zinnia	500,000	19/4.12	253.3	20.60	696.9	4,280	0.1136
Dahila	556,500	19/4.35	282.3	21.75	777.0	4,770	0.1019
–	550,000	37/3.10	279.3	21.70	769.9	4,920	0.1032
Meadowsweet	600,000	37/3.23	303.2	22.61	835.9	5,330	0.09508
Orchid	636,000	37/3.33	322.2	23.31	888.4	5,660	0.08946
Heuchera	650,000	37/3.37	330.0	23.59	909.9	5,810	0.08736
Herbena	700,000	37/3.49	353.9	24.43	976.0	6,220	0.08146
Petunia	750,000	37/3.62	380.7	25.34	1,050	6,550	0.07573
–	800,000	37/3.73	402.2	26.11	1,115	6,960	0.07129
Cockscomb	900,000	37/3.96	455.8	27.72	1,257	7,700	0.06324
Hawkweed	1,000,000	37/4.18	507.6	29.26	1,400	8,550	0.05679
–	1,100,000	61/3.41	557.1	30.69	1,539	9,820	0.05185
–	1,200,000	61/3.56	607.2	32.04	1,678	10,490	0.04758
–	1,300,000	61/3.71	659.4	33.39	1,822	11,350	0.04381
–	1,400,000	61/3.85	710.0	34.65	1,961	11,960	0.04068
–	1,500,000	61/3.98	758.8	35.82	2,086	12,810	0.03807
–	1,600,000	61/4.11	809.5	36.99	2,236	13,660	0.03569
–	1,700,000	61/4.24	861.3	38.16	2,380	14,520	0.03354
–	1,800,000	91/3.57	910.9	39.27	2,519	15,650	0.03175

ACSR

BS 215 : Part 2 : 1970

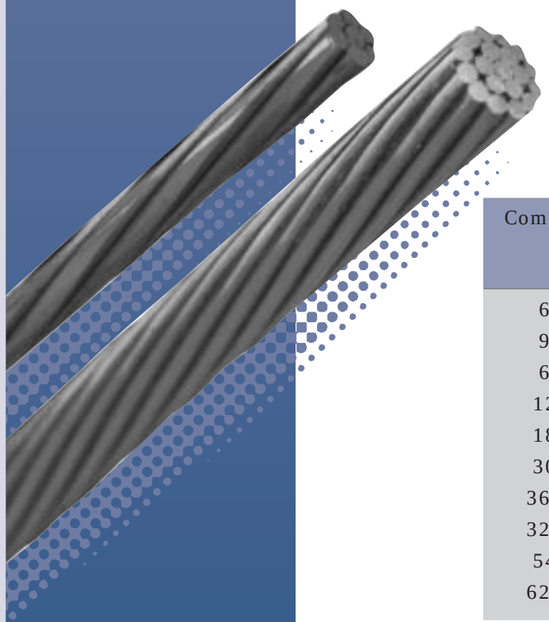
ACSR code word	Conductor size	Stranding Nos./mm		Calculated sectional area mm²		Overall diameter mm		Weight kg/km			Ultimate strength		Calculated electrical resistance
	mm2	Alumi-nium	Steel	Alumi-nium	ACSR	ACSR	Steel	ACSR	Alumi-nium	Steel	kN	kg	at 20°C ohm/km
Gopher	25	6/2.36	1/2.36	26.24	30.62	7.08	2.36	106	72.0	34.1	9.61	980	1.093
Weasel	30	6/2.59	1/2.59	31.61	36.88	7.77	2.59	128	86.7	41.1	11.45	1,170	0.9077
Ferret	40	6/3.00	1/3.00	42.41	49.48	9.00	3.00	172	116.4	55.1	15.20	1,550	0.6766
Rabbit	50	6/3.35	1/3.35	52.88	61.70	10.05	3.35	214	145.1	68.8	18.35	1,870	0.5426
Horse	70	12/2.79	7/2.79	73.37	116.2	13.95	8.37	538	202.7	335.4	61.20	6,240	0.3936
Dog	100	6/4.72	7/1.57	105.0	118.5	14.15	4.71	394	288.1	106.2	32.70	3,330	0.2733
Wolf	150	30/2.59	7/2.59	158.1	194.9	18.13	7.77	726	436.7	288.9	69.2	7,060	0.1828
Dingo	150	18/3.35	1/3.35	158.7	167.5	16.75	3.35	506	436.7	68.75	35.7	3,640	0.1815
Lynx	175	30/2.79	7/2.79	183.4	226.2	19.53	8.37	842	507.0	335.4	79.8	8,140	0.1576
Caracal	175	18/3.61	1/3.61	184.3	194.5	18.05	3.61	587	507.5	79.84	41.10	4,190	0.1563
Panthar	200	30/3.00	7/3.00	212.1	261.5	21.00	9.00	974	586.1	387.7	92.25	9,410	0.1363
Jaguar	200	18/3.86	1/3.86	210.6	222.3	19.30	3.86	671	580.1	91.28	46.55	4.750	0.1367
Zebra	400	54/3.18	7/3.18	428.9	484.5	28.62	9.54	1,621	1,185.8	435.6	131.9	13,450	0.0674

Semistandard Size

ACSR code word	Conductor size	Stranding Nos./mm		Calculated sectional area mm²		Overall diameter mm		Weight kg/km			Ultimate strength		Calculated electrical resistance
	mm²	Alumi-nium	Steel	Alumi-nium	ACSR	ACSR	Steel	ACSR	Alumi-nium	Steel	kN	kg	at 20°C ohm/km
Fox	35	6/2.79	1/2.79	36.68	42.80	8.37	2.79	148	100.7	47.69	13.15	1,340	0.7822
Mink	60	6/3.66	1/3.66	63.12	72.64	10.98	3.66	255	173.2	82.06	21.80	2,220	0.4546
Shunk	60	12/2.59	7/2.59	63.23	100.1	12.95	7.77	464	174.6	288.9	52.90	5,400	0.4568
Beaver	75	6/3.99	1/3.99	75.00	87.50	11.97	3.99	303	205.8	97.50	25.75	2,630	0.3826
Raccoon	75	6/4.09	1/4.09	78.84	91.98	12.27	4.09	319	216.3	102.5	27.05	2,760	0.3639
Otter	80	6/4.22	1/4.22	83.94	97.93	12.66	4.22	339	230.3	109.1	28.80	2,940	0.3418
Cat	95	6/4.50	1/4.50	95.40	111.3	13.50	4.50	386	261.8	124.0	32.65	3,330	0.3008
Hare	105	6/4.72	1/4.72	105.0	122.5	14.16	4.72	425	288.1	136.5	35.95	3,670	0.2733
Hyena	105	7/4.39	7/1.93	106.0	126.5	14.57	5.79	451	290.8	160.5	41.00	4,180	0.2707
Leopard	130	6/5.28	7/1.75	131.4	148.2	15.81	5.25	492	360.5	131.9	40.75	4,160	0.2196
Tiger	130	30/2.36	7/2.36	131.2	161.8	16.52	7.08	602	362.5	239.9	58.00	5,910	0.2202
Coyote	130	26/2.54	7/1.91	131.7	151.8	15.89	5.73	521	363.9	157.2	46.35	4,730	0.2191
Lion	235	30/3.18	7/3.18	238.3	293.9	22.26	9.54	1,094	658.5	435.6	100.4	10,240	0.1213
Bear	260	30/3.35	7/3.35	264.4	326.1	23.45	10.05	1,214	730.6	483.5	111.2	11,340	0.1093
Batang	300	18/4.78	7/1.68	323.1	338.6	24.16	5.04	1,015	889.9	121.6	69.6	7,097	0.0892
Goat	320	30/3.71	7/3.71	324.3	400.0	25.97	11.13	1,489	896.2	592.9	135.8	13,850	0.08912
Antelope	370	54/2.97	7/2.97	374.1	422.6	26.73	8.91	1,415	1,034.5	380.0	118.5	12,080	0.07728
Sheep	375	30/3.99	7/3.99	375.0	462.5	27.93	11.97	1,722	1,036.3	685.6	156.3	15,940	0.07705
Bison	380	54/3.00	7/3.00	381.7	431.2	27.00	9.00	1,443	1,055.4	387.7	120.9	12,330	0.07574
Deer	425	30/4.27	7/4.27	429.6	529.8	29.89	12.81	1,973	1,187.2	785.5	178.6	16,210	0.06727
Camel	475	54/3.35	7/3.35	476.0	537.7	30.15	10.05	1,799	1,315.6	483.5	145.9	14,880	0.06074
Elk	475	30/4.50	7/4.50	477.0	588.3	31.50	13.50	2,190	1,318.2	872.0	198.3	20,220	0.06059
Moose	525	54/3.53	7/3.53	528.5	597.0	31.77	10.59	1,998	1,460.8	536.9	161.0	16,420	0.05470

ACSR

ALUMINIUM CONDUCTOR STEEL REINFORCED



Characteristics

- Alluminium strand outer layer/layers are formed with centre core of single/stranded galvanised steel wires.
- Can be suitably designed for increased mechanical strength needs by increasing number of steel wires.
- Can be suitably designed for average mechanical needs by using higher aluminium & lower steel contents.
- Suited for large spans with metal towers
- High mechanical strength to weight ratio
- ACSR yield less sag at a given tension
- Toughness is suited to extreme wind loads
- Corona losses are least due to large diameters.

Composition	Final modulus of elasticity M Pa (1)	Coefficient of linear expansion / °C
6+1*	79000	$19.1x10^{-6}$
9+3*	88000	$17.1x10^{-6}$
6+7*	75000	$19.8x10^{-6}$
12+7*	103500	$54.4x10^{-6}$
18+1*	66000	$21.2x10^{-6}$
30+7*	75500	$18.0x10^{-6}$
36+19*	79000	$16.9x10^{-6}$
32+19*	72000	$17.6x10^{-6}$
54+7*	69000	$19.3x10^{-6}$
62+19*	62000	$18.3x10^{-6}$

ACSR

1. ASTM B232-81

ACSR code word	Conductor size CM or AWG	Stranding Nos./mm		Calculated sectional area mm2		Overall diameter mm		Weight kg/mm			Ultimate stength	Calculated D.C. resistance at 20°C ohm/km
		Alumi-nium	Steel	Aluminium	ACSR	ACSR	Steel	ACSR	Alumi-nium	Steel	kg	
Thrasher	2,312,000	76/4.430	19/2.068	1,172	1,235	45.78	10.34	3,760	3,261	499.4	25,700	0.02477
Kiwi	2,167,000	72/4.407	7/2.939	1,098	1,145	44.07	8.817	3,429	3,058	370.6	22,600	0.02642
Bluebird	2,156,000	84/4.069	19/2.441	1,092	1,181	44.76	12.21	3,737	3,041	695.9	27,300	0.02656
Chukar	1,780,000	84/3.698	19/2.220	901.9	975.8	40.68	11.10	3,088	2,512	575.5	23,200	0.03216
Falcon	1,590,000	54/4.359	19/2.616	805.7	907.8	39.23	13.08	3,043	2,244	799.3	24,700	0.03601
Lapwing	1,590,000	45/4.775	7/3.183	805.7	861.7	38.19	9.549	2,667	2,232	435.1	19,200	0.03583
Parrot	1,510,500	54/4.247	19/2.548	765.4	862.1	38.22	12.74	2,888	2,130	758.3	22,500	0.03794
Nuthatch	1,510,500	45/4.653	7/3.101	765.4	817.9	37.22	9.303	2,533	2,120	413.0	18,200	0.03774
Plover	1,431,000	54/4.135	19/2.482	725.1	817.1	37.22	12.41	2,739	2,019	719.5	22,300	0.04002
Bobolink	1,431,000	45/4.529	7/3.020	725.1	775.1	36.23	9.060	2,401	2,009	391.7	17,400	0.03984
Martin	1,351,500	54/4.018	19/2.410	684.8	771.4	36.16	12.05	2,584	1,906	678.4	21,000	0.04238
Dipper	1,351,500	45/4.402	7/2.934	684.8	732.2	35.21	8.802	2,268	1,898	369.7	16,600	0.04216
Pheasant	1,272,000	54/3.899	19/2.339	644.5	726.4	35.09	11.70	2,434	1,795	639.0	19,800	0.04501
Bittern	1,272,000	45/4.270	7/2.847	644.5	689	34.16	8.541	2,133	1,785	348.1	15,500	0.04480
Skylark	1,272,000	36/4.775	1/4.775	644.5	662.7	33.43	4.775	1,916	1,777	139.3	12,000	0.04457
Grackle	1,192,500	54/3.774	19/2.266	604.2	681.1	33.97	11.33	2,282	1,682	599.8	19,000	0.04803
Bunting	1,192,500	45/4.135	7/2.756	604.2	646.2	33.07	8.268	2,000	1,674	326.2	14,500	0.04779
Finch	1,113,000	54/3.647	19/2.189	564.0	636.9	32.83	10.95	2,131	1,571	559.7	17,800	0.05144
Bluejay	1,113,000	45/3.995	7/2.664	564.0	603.3	31.96	7.992	1,868	1,563	304.7	13,600	0.05118
Curlew	1,033,500	54/3.513	7/3.513	523.7	591.3	31.62	10.54	1,980	1,450	529.5	16,600	0.05518
Ortolan	1,033,500	45/3.848	7/2.565	523.7	559.6	30.78	7.695	1,733	1,450	282.5	12,600	0.05517
Tanager	1,033,500	36/4.303	1/4.303	523.7	537.9	30.12	4.303	1,556	1,443	113.1	9,710	0.05488
Cardinal	954,000	54/3.376	7/3.376	483.4	546.1	30.39	10.13	1,828	1,339	488.9	15,400	0.05973
Rail	954,000	45/3.698	7/2.466	483.4	516.7	29.59	7.398	1,600	1,339	261.2	11,700	0.05975
Catbird	954,000	36/4.135	1/4.135	483.4	496.9	28.95	4.135	1,438	1,333	104.5	8,980	0.05944
Canary	900,000	54/3.279	7/3.279	456.0	515.1	29.51	9.837	1,725	1,264	461.3	14,500	0.06332
Ruddy	900,000	45/3.592	7/2.395	456.0	487.4	28.74	7.185	1,509	1,263	246.3	11,100	0.06332
Mallard	795,000	30/4.135	19/2.482	402.8	494.8	28.95	12.41	1,839	1,119	719.5	17,400	0.07186
Condor	795,000	54/3.081	7/3.081	402.8	454.8	27.73	9.243	1,522	1,115	407.2	12,800	0.07173
Tern	795,000	45/3.376	7/2.250	402.8	430.6	27.01	6.750	1,333	1,116	217.4	10,000	0.07168
Coot	795,000	36/3.774	1/3.774	402.8	414	26.42	3.774	1,197	1,110	87.03	7,610	0.07134
Drake	795,000	26/4.442	7/3.454	402.8	468.6	28.13	10.36	1,628	1,116	512.3	14,300	0.07167
Cuckoo	795,000	24/4.623	7/3.081	402.8	455.2	27.73	9.243	1,524	1,116	407.6	12,700	0.07166
Redwing	715,500	30/3.922	19/2.352	362.5	445	27.45	11.76	1,653	1,007	646.1	15,700	0.07987
Starling	715,500	26/4.214	7/3.277	362.5	421.7	26.69	9.831	1,466	1,005	461.2	12,900	0.07963
Stilt	715,500	24/4.387	7/2.924	362.5	409.9	26.32	8.772	1,372	1,005	367.1	11,600	0.07961
Gannet	666,600	26/4.067	7/3.162	337.8	392.7	25.75	9.486	1,365	935.7	429.3	12,000	0.08551
Flamingo	666,600	24/4.234	7/2.822	337.8	381.7	25.40	8.466	1,278	936.3	342	10,800	0.08546
Swift	636,000	36/3.376	1/3.376	322.3	331.2	23.63	3.376	958.2	888.6	69.64	6,240	0.08916
Egret	636,000	30/3.698	19/2.220	322.3	395.8	25.89	11.10	1,470	894.8	575.5	14,300	0.08984
Scoter	636,000	30/3.698	7/3.698	322.3	397.4	25.89	11.09	1,483	894.8	587.8	13,800	0.08984
Grosbeak	636,000	26/3.973	7/3.089	322.3	374.9	25.15	9.267	1,303	893	409.8	11,500	0.08957
Rook	636,000	24/4.135	7/2.756	322.3	364.1	24.80	8.268	1,219	893	326.2	10,300	0.08960
Kingbird	636,000	18/4.775	1/4.775	322.3	340.3	23.88	4.775	1,028	888.6	139.3	7,120	0.08914
Teal	605,000	30/3.607	19/2.164	306.6	376.5	25.25	10.82	1,398	851.4	546.9	13,600	0.09443

ACSR

1. ASTM B232-81 (Contd.)

ACSR code word	Conductor size CM or AWG	Stranding Nos./mm		Calculated sectional area mm2		Overall diameter mm		Weight kg/mm			Ultimate strength	Calculated D.C. resistance at 20°C ohm/km
		Alumi-nium	Steel	Aluminium	ACSR	ACSR	Steel	ACSR	Alumi-nium	Steel	kg	
Wood Duck	605,000	30/3.607	7/3.607	306.6	378.1	25.25	10.82	1,411	851.4	559.3	13,200	0.09443
Squab	605,000	26/3.874	7/3.012	306.6	356.4	24.53	9.036	1,239	849.1	389.6	11,000	0.09422
Peacock	605,000	24/4.034	7/2.690	306.6	346.5	24.21	8.070	1,161	849.9	310.8	9,790	0.09413
Eagle	566,500	30/3.459	7/3.459	282.0	347.7	24.21	10.38	1,297	783	514.3	12,600	0.1027
Dove	556,500	26/3.716	7/2.891	282.0	328.1	23.53	8.673	1,140	781.1	358.9	103,000	0.1024
Parakeet	556,500	24/3.868	7/2.578	282.0	318.5	23.20	7.734	1,067	781.3	285.4	8,980	0.1024
Osprey	556,500	18/4.465	1/4.465	282.0	297.6	22.33	4.465	898.8	777.0	121.8	6,220	0.1019
Hen	477,000	30/3.203	7/3.203	241.7	298.1	22.42	9.609	1,112	671.4	441.0	10,800	0.1197
Hawk	477,000	26/3.439	7/2.675	241.7	280.8	21.78	8.025	976.5	669.2	307.3	8,850	0.1196
Flicker	477,000	24/3.581	7/2.388	241.7	273.1	21.48	7.164	914.5	669.6	244.9	7,770	0.1195
Pelican	477,000	18/4.135	1/4.135	241.7	255.1	20.68	4.135	771.0	666.5	104.5	5,350	0.1189
Lark	397,500	30/2.924	7/2.924	201.4	248.5	20.47	8.772	927.0	559.5	367.5	9,220	0.1437
Ibis	397,500	26/3.139	7/2.441	201.4	234.0	19.88	7.323	813.4	557.5	255.9	7,370	0.1435
Brant	397,500	24/3.269	7/2.179	201.4	227.5	19.61	6.537	762.1	558.2	203.9	6,660	0.1434
Chickadee	397,500	18/3.774	1/3.774	201.4	212.6	18.87	3.774	642.2	555.2	87.03	4,520	0.1427
Oriole	336,400	30/2.690	7/2.690	170.5	210.3	18.83	8.070	784.6	473.5	311.1	7,870	0.1698
Linnet	336,400	26/2.888	7/2.245	170.5	198.0	18.28	6.735	688.5	472	216.5	6,390	0.1696
Merlin	336,400	18/3.472	1/3.472	170.5	179.9	17.36	3.472	543.5	469.8	73.66	3,930	0.1686
Ostrich	300,000	26/2.728	7/2.121	152.0	176.7	17.27	6.363	614.3	421.1	193.2	5,770	0.1900
Partridge	266,800	26/2.573	7/2.002	135.2	157.2	16.29	6.006	546.5	374.4	172.1	5,130	0.2136
Waxwing	266,800	18/3.091	1/3.091	135.2	142.6	15.46	3.091	430.7	372.3	58.38	3,120	0.2127
Penguin	(4/0)	6/4.770	1/4.770	107.2	125.1	14.31	4.770	433.1	294.1	139.0	3,790	0.2666
Pigeon	(3/0)	6/4.247	1/4.247	85.03	99.19	12.74	4.247	343.4	233.2	110.2	3,010	0.3365
Quail	(2/0)	6/3.782	1/3.782	67.44	78.61	11.35	3.782	272.4	185.0	87.40	2,410	0.4243
Raven	(1/0)	6/3.371	1/3.371	53.51	62.48	10.11	3.371	216.3	146.9	69.44	1,990	0.5341
Robin	(1)	6/3.000	1/3.000	42.41	49.48	9.000	3.000	171.4	116.4	54.99	1,610	0.6743
Sparate	(2)	7/2.474	1/3.299	33.63	42.20	8.247	3.299	158.8	92.29	66.50	1,660	0.8497
Sparrow	(2)	6/2.672	1/2.672	33.63	39.25	8.016	2.672	136.0	92.32	43.63	1,290	0.8499
Swanate	(4)	7/1.961	1/2.614	21.15	26.51	6.536	2.614	99.76	58.01	41.75	1,070	1.353
Swan	(4)	6/2.118	1/2.118	21.15	24.67	6.354	2.118	85.41	58.00	27.41	845	1.353
Turkey	(6)	6/1.679	1/1.679	13.28	15.50	5.037	1.679	53.67	36.44	17.23	541	2.152
Cochin	211,300	12/3.371	7/3.371	107.1	169.6	16.86	10.11	785.2	296.7	488.5	9,410	0.2697
Brahma	203,200	16/2.863	19/2.482	103.0	194.9	18.14	12.41	1,008	285.4	722.3	12,900	0.2803
Dorking	190,800	12/3.203	7/3.203	96.68	153.1	16.02	9.609	708.9	267.9	441.0	8,490	0.2986
Dotterel	176,900	12/3.084	7/3.084	89.64	141.9	15.42	9.252	657.2	248.3	408.9	7,890	0.3221
Guinea	159,000	12/2.924	7/2.924	80.57	127.6	14.62	8.772	590.7	223.2	367.5	7,250	0.3583
Leghorn	134,600	12/2.690	7/2.690	68.20	108.0	13.45	8.070	500.0	188.9	311.1	6,160	0.4234
Minorca	110,800	12/2.441	7/2.441	56.14	88.92	12.21	7.323	411.7	155.6	256.1	5,110	0.5142
Petrel	101,800	12/2.339	7/2.339	51.58	81.64	11.70	7.017	378.0	142.8	235.2	4,700	0.5600
Grouse	80,000	8/2.540	1/4.242	40.54	54.67	9.322	4.242	221.6	111.8	110.0	2,370	0.7089

AAAC/AACSR

ALL ALUMINIUM ALLOY CONDUCTORS

ALUMINIUM ALLOY CONDUCTORS STEEL REINFORCED

AAAC

Compo-sition	Final modo-lus of elas-ticity Mpa	Coefficient of linear expansion /°C
7	62 000	$23x10^{-6}$
19	60 000	$23x10^{-6}$
37	57 000	$23x10^{-6}$
61	54 000	$23x10^{-6}$

AACSR

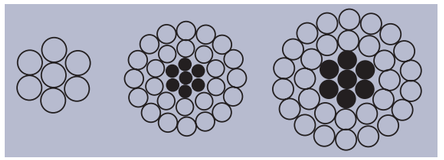
Compo-sition	Final modo-lus of elas-ticity Mpa	Coefficient of linear expansion /°C
6+1 (1)	80 000	$19.1x10^{-6}$
9+3	93 000	$17.0x10^{-6}$
6+7	75 000	$19.8x10^{-6}$
12+7	108 000	$15.3x10^{-6}$
18+19	124 000	$14.2x10^{-6}$
26+7	75 000	$18.9x10^{-6}$
30+7	84 000	$18.0x10^{-6}$
30+19	80 000	$18.0x10^{-6}$
42+19	96 500	$16.3x10^{-6}$
54+7	70 000	$18.0x10^{-6}$
54+19	68 000	$19.3x10^{-6}$

Characteristics AAAC

- Strands of same diameter in Aluminium - Magnesium-Silicon group alloys, duly heat treated.
- Has almost double the tensile strength of pure aluminium strands and thereby are ideal for long spans.
- Suited as an alternate to ACSR or AAC depending on line engineer needs.
- Low electrical losses compared to ACSR
- Superior corrosion resistance.
- Ideal for seacoasts, saline and corrossion prone areas.
- Suited for developing countries in order to avoid pilferage & thefts.

Characterstics AACSR

- Strands of Aluminium Alloy as outer layers and with core of Steel wire/wires.
- Excellent balance between mechanical & electrical properties.
- Can be configured as per the needs of the line engineer.



ACSR CSA C-49 - 1965

ACSR code word	Conductor size CM or AWG	Stranding Nos./mm		Calculated sectional area mm2		Overall diameter mm		Weight kg/km			Ultimate strength	Calculated DC resistance at 20°C ohm/km
		Alumi-nium	Steel	Alumi-nium	ACSR	ACSR	Steel	ACSR	Alumi-nium	Steel	kg	
Bantam	13,100	3/1.68	4/1.68	6.651	15.52	5.04	-	88.01	18.25	69.76	1,190	4.314
Magpie	20,870	3/2.12	4/2.12	10.59	24.71	6.36	-	140.1	29.06	110.0	1,890	2.709
Shrike	33,200	3/2.67	4/2.67	16.80	39.20	8.01	-	222.3	46.07	176.2	2,900	1.708
Snipe	52,825	3/3.37	4/3.37	26.76	62.44	10.11	-	354.1	73.41	280.7	4,470	1.072
Loon	66,500	3/3.78	4/3.78	33.66	78.54	11.34	-	445.4	92.35	353.0	5,320	0.8523
Petrel	101,800	12/2.34	7/2.34	51.61	81.72	11.70	7.02	377.5	'142.5	235.0	4,470	0.5597
Minorca	110,800	12/2.44	7/2.44	56.11	88.84	12.20	7.32	410.6	155.0	255.6	4,860	0.5148
Leghorn	134,600	12/2.69	7/2.69	68.20	108.0	13.45	8.07	499.0	188.4	310.6	5,860	0.4236
Guinea	159,000	12/2.92	7/2.92	80.36	127.2	14.60	8.76	568.0	222.0	366.0	6,880	0.3595
Dotterel	176,600	12/3.08	7/3.08	89.41	141.6	15.40	9.24	654.2	247.0	407.2	7,440	0.3230
Dorking	190,800	12/3.20	7/3.20	96.50	152.8	16.00	9.60	706.1	266.6	439.5	8,030	0.2994
Brahma	203,200	16/2.86	19/2.48	102.8	194.6	18.12	12.40	100.3	284.4	718.0	12,480	0.2816
Cochin	211,300	12/3.37	7/3.37	107.0	169.4	16.85	10.11	783.2	295.7	487.5	8,880	0.2699
Wren	(8)	6/1.33	1/1.33	8.334	9.723	3.99	1.33	33.67	22.86	10.81	336	3.443
Warbler	(7)	6/1.50	1/1.50	10.60	12.37	4.50	1.50	42.84	29.09	13.75	427	2.707
Turkey	(6)	6/1.68	1/1.68	13.30	15.52	5.04	1.68	53.75	36.50	17.25	531	2.157
Thrush	(5)	6/1.89	1/1.89	16.84	19.65	5.67	1.89	68.02	46.19	21.83	667	1.704
Swan	(4)	6/2.12	1/2.12	21.18	24.71	6.36	2.12	85.57	58.11	27.46	831	1.355
Swallow	(3)	6/2.38	1/2.38	26.69	31.14	7.14	2.38	107.9	73.26	34.61	1,020	1.075
Sparrow	(2)	6/2.67	1/2.67	33.59	39.19	8.01	2.67	135.7	92.14	43.56	1,260	0.8540
Robin	(1)	6/3.00	1/3.00	42.41	49.48	9.00	3.00	171.4	116.4	55.00	1,580	0.6763
Raven	(1/0)	6/3.37	1/3.37	53.52	60.44	10.11	3.37	216.2	146.8	69.40	1,940	0.5361
Quail	(2/0)	6/3.78	1/3.78	67.32	78.54	11.34	3.78	273.0	184.7	87.29	2,420	0.4261
Pigeon	(3/0)	6/4.25	1/4.25	85.14	99.33	12.75	4.25	344.0	233.6	110.4	3,030	0.3370
Penguin	(4/0)	6/4.77	1/4.77	107.2	125.1	14.31	4.77	433.1	294.1	139.0	3,820	0.2676
Owl	266,800	6/5.36	7/1.79	135.4	153.0	16.09	5.37	508.9	371.4	137.5	4,345	0.2120
Waxwing	266,800	18/3.09	1/3.09	135.0	142.5	15.45	3.09	430.1	371.8	58.84	3,220	0.2134
Patridge	266,800	26/2.57	7/2.00	134.9	156.9	16.28	6.00	543.9	372.2	171.7	5,090	0.2140
Phoebe	300,000	18/3.28	1/3.28	152.1	160.6	16.40	3.28	484.6	418.9	65.74	3,630	0.1894
Ostrich	300,000	26/2.73	7/2.12	152.2	177.0	17.28	6.36	612.9	420.0	192.9	5,740	0.1896
Piper	300,000	30/2.54	7/2.54	152.0	187.5	17.78	7.62	696.9	420.0	276.9	7,000	0.1900
Merilin	336,400	18/3.47	1/3.47	170.2	179.7	17.35	3.47	542.4	468.8	73.58	4,050	0.1692
Linnet	336,400	26/2.89	7/2.25	170.6	198.4	18.31	6.75	688.0	470.7	217.3	6,390	0.1692
Oriole	336,400	30/2.69	7/2.69	170.5	210.3	18.83	8.07	781.5	470.9	310.6	7,730	0.1694
Chickadee	397,500	18/3.77	1/3.77	200.9	212.1	18.85	3.77	640.2	553.4	86.82	4,720	0.1434
Ibis	397,500	26/3.14	7/2.44	201.3	234	19.88	7.32	811.2	555.6	255.6	7,330	0.1433
Lark	397,500	30/2.92	7/2.92	200.9	247.8	20.44	8.76	920.9	554.9	366.0	9,040	0.1438
Pelican	477,000	18/4.14	1/4.14	242.3	255.8	20.70	4.14	772.0	667.3	104.7	5,600	0.1189
–	477,000	22/3.74	7/2.08	241.8	265.6	21.20	6.24	852.4	666.7	185.7	7,000	0.1192
Hawk	477,000	26/3.44	7/2.67	241.6	280.8	21.77	8.01	972.8	666.8	306.0	8,780	0.1194
Hen	477,000	30/3.20	7/3.20	241.3	297.6	22.40	9.60	1,106	666.5	439.5	10,570	0.1197
Heron	500,000	30/3.28	7/3.28	253.5	312.7	22.96	9.84	1,162	700.3	461.8	11,130	0.1140

CSA C-49 - 1965 (Contd.)

ACSR code word	Conductor size CM or AWG	Stranding Nos./mm		Calculated sectional area mm²		Overall diameter mm		Weight kg/km			Ultimate strength kg	Calculated DC resistance at 20°C ohm/km
		Alumi-nium	Steel	Alumi-nium	ACSR	ACSR	Steel	ACSR	Alumi-nium	Steel		
–	556,500	22/4.04	7/2.24	282.0	309.6	22.88	6.72	992.9	777.5	215.4	8,050	0.1022
Dove	556,500	26/3.72	7/2.89	282.6	328.5	23.55	8.67	1,138	779.9	358.5	10,190	0.1021
Eagle	556,500	30/3.46	7/3.45	242.1	317.9	24.22	10.38	1,293	779.1	513.8	12,370	0.1024
–	605,000	22/4.21	7/2.34	306.2	336.3	23.86	7.02	1,079	844.4	235.0	8,660	0.09412
Duck	605,000	54/2.69	7/2.69	306.9	346.7	24.21	8.07	1,159	848.5	310.6	10,230	0.09423
–	636,000	22/4.32	7/2.40	322.5	354.2	24.48	7.20	1,137	889.3	247.3	9,110	0.08039
Grosbeak	636,000	26/3.97	7/3.09	321.9	374.4	25.15	9.27	1,298	888.2	409.8	11,340	0.68965
Egret	636,000	30/3.70	19/2.22	322.5	396.1	25.90	11.10	1,467	891.0	576.0	14,350	0.08956
Goose	636,000	54/2.76	7/2.76	323.1	365.0	24.84	8.28	1,220	893.3	327.0	10,740	0.08949
–	666,600	42/3.20	7/1.78	338.8	355.2	24.54	5.34	1,069	933.2	136.0	8,000	0.08553
Gull	666,600	54/2.82	7/2.82	337.3	381.0	25.38	8.46	1,274	932.5	341.3	11,120	0.08572
Starling	715,000	26/4.21	7/3.28	361.9	421.1	26.68	9.84	1,461	998.9	461.8	12,770	0.07972
Redwing	715,000	30/3.92	19/2.35	362.1	444.5	27.43	11.75	1,645	1,000	645.2	15,680	0.07979
–	715,000	42/3.31	7/1.84	361.4	380.0	25.38	5.52	1,144	998.4	145.3	8,570	0.07993
Crow	715,000	54/2.92	7/2.92	361.6	408.5	26.28	8.76	1,366	999.9	366.0	11,920	0.07996
Drake	795,000	26/4.44	7/3.45	402.5	467.9	28.11	10.35	1,622	1,111	510.9	14,140	0.07171
Mallard	795,000	30/4.14	19/2.48	403.8	495.6	28.96	12.40	1,834	1,115	718.9	17,450	0.07154
–	795,000	42/3.50	7/1.94	404.1	424.8	26.82	5.82	1,279	1,117	161.6	9,570	0.07149
Condor	795,000	54/3.08	7/3.08	402.4	454.6	27.72	9.24	1,520	1,113	407.2	12,940	0.07185
–	874,500	42/3.67	7/3.04	444.4	467.3	28.14	6.12	1,407	1,228	178.6	10,380	0.06502
Crane	874,500	54/3.23	7/3.23	442.5	499.9	29.97	9.60	1,672	1,224	147.8	14,230	0.06534
–	900,000	42/3.72	7/2.07	465.5	480.1	28.53	6.21	1,445	1,261	183.9	10,670	0.06327
Canary	900,000	54/3.28	7/2.28	456.3	515.5	29.52	9.84	1,724	1,262	461.8	14,700	0.06337
–	954,000	42/2.88	7/2.13	483.8	508.7	29.37	6.39	1,532	1,337	194.7	11,130	0.05971
Cardinal	954,000	54/3.38	7/3.38	484.5	547.3	30.42	10.14	1,230	1,340	490.4	15,600	0.05967
–	1,033,500	42/3.99	7/2.21	525.0	551.9	30.57	6.63	1,660	1,450	209.6	12,070	0.05502
Curlew	1,033,500	54/3.51	7/3.51	522.5	590.2	31.59	10.53	1,974	1,445	528.5	16,810	0.05534
–	1,113,000	42/4.14	7/2.30	565.3	594.4	31.74	6.90	1,789	1,562	227.1	12,910	0.05110
Finch	1,113,000	52/3.65	19/2.19	564.8	636.4	32.85	10.95	2,124	1,562	562.4	18,270	0.05119
–	1,192,000	42/4.28	7/2.38	604.4	635.5	32.82	7.14	1,913	1,670	243.1	13,820	0.04779
Grackle	1,192,000	54/3.77	19/2.27	402.6	479.5	33.97	11.35	2,269	1,667	602.2	19,560	0.04799
–	1,272,000	42/4.42	7/2.46	644.3	677.6	33.90	7.38	2,040	1,780	259.8	14,735	0.04485
Pheasant	1,272,000	54/3.90	19/2.34	645.3	727.0	35.10	11.70	2,424	1,784	639.9	20,390	0.04480
–	1,351,000	42/4.56	7/2.53	685.9	721.1	34.95	7.59	2,170	1,895	274.7	15,630	0.04212
Martin	1,351,000	54/4.02	19/2.41	685.3	772.0	36.17	12.05	2,574	1,895	678.9	21,610	0.04219
–	1,431,000	42/4.69	7/2.61	725.8	763.3	35.97	7.83	2,297	2,005	292.4	16,610	0.03981
Plover	1,431,000	54/4.14	19/2.48	726.8	818.0	37.24	12.40	2,729	2,010	718.9	22,900	0.03978
–	1,510,500	42/4.82	7/2.67	766.5	805.7	36.93	8.01	2,423	2,117	306.0	17,480	0.03769
Parrot	1,510,500	54/4.25	19/2.55	766.3	863.3	38.25	12.75	2,879	2,119	759.8	24,150	0.03774
–	1,590,000	48/4.62	7/3.60	804.5	875.8	38.52	10.80	2,778	2,222	556.3	21,630	0.03590
Falcon	1,590,000	54/4.36	19/2.62	806.2	908.6	39.26	13.10	3,032	2,230	802.1	25,480	0.03586
–	1,590,000	72/3.77	7/2.52	803.5	838.4	37.72	7.56	2,495	2,222	272.6	17,880	0.03599

Australian Standard 1220 Part 1 - 1973

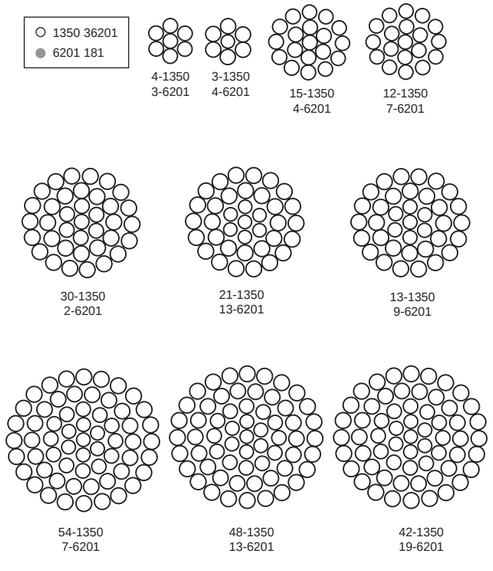
code word	Conductor size mm2	Stranding Nos./mm		Calculated sectional area mm2		Overall diameter mm		Weight kg/km			Ultimate strength kN	Calculated D.C resistance at 20°C ohm/km
		Aluminium	Steel	Aluminium	ACSR	ACSR	Steel	ACSR	Aluminium	Steel		
Quince	7	3/1.75	4/1.75	7.215	16.84	5.25	–	95.9	19.60	76.30	12.7	3.24
Raisin	15	3/2.50	4/2.50	14.73	34.36	7.50	–	193	40.11	152.6	24.4	1.58
Sultana	28	4/3.00	3/3.00	28.28	49.48	9.00	–	242	76.80	165.6	28.3	0.893
Walnut	44	4/3.75	3/3.75	44.16	77.31	11.25	–	379	120.2	258.9	43.9	0.570
Almond	29	6/2.50	1/2.50	29.45	34.36	7.50	2.50	119	81.0	38	10.5	0.975
Apple	42	6/3.00	1/3.00	42.41	49.48	9.00	3.00	171	116.3	55	14.9	0.677
Banana	66	6/3.75	1/3.75	66.24	77.31	11.25	3.75	268	182.1	86	22.8	0.433
Cherry	106	6/4.75	7/1.60	106.32	120.40	14.3	4.80	404	291.8	112.5	33	0.271
Grape	147	30/2.50	7/2.50	147.27	181.60	17.5	7.5	675	407.9	267.2	63.7	0.196
Lemon	212	30/3.00	7/3.00	212.07	261.50	21.0	9	973	585.8	386.8	90.1	0.136
Lime	289	30/3.50	7/3.50	288.63	356.0	24.5	10.5	1,325	797.4	527.4	121	0.100
Mango	382	54/3.00	7/3.00	381.73	431.2	27.0	9.0	1,442	1,055	386.8	118	0.0758
Orange	448	54/3.25	7/3.25	447.98	506.0	29.3	9.75	1,694	1,237	457.1	137	0.0646
Olive	520	54/3.50	7/3.50	519.53	586.9	31.5	10.5	1,963	1,436	527.4	159	0.0557
Pawpaw	596	54/3.75	19/2.25	596.16	671.7	33.8	11.25	2,245	1,651	593.7	179	0.0485
Peach	957	54/4.75	19/2.85	956.88	1,085	42.8	14.25	3,661	2,646	1,015	292	0.0303

Japanese industrial standard - JIS C 3110 - 1978

Conductor size mm²	Stranding Nos./mm		Calculated Sectional area mm²		Overall diameter mm		Weight kg/mm			Ultimate strength kg	Calculated D.C. resistance at 20°C ohm/km
	Alumi-nium	Steel	Alumi-nium	ACSR	ACSR	Steel	ACSR	Alumi-nium	Steel		
25	6/2.3	1/2.3	24.93	29.09	6.9	2.3	100.7	68.29	32.41	907	1.15
32	6/2.6	1/2.6	31.85	37.16	7.8	2.6	128.6	87.18	41.41	1,140	0.899
58	6/3.5	1/3.5	57.73	67.35	10.5	3.5	233.1	158.1	75.04	1,980	0.497
80	6/4.2	1/4.2	83.10	96.95	12.6	4.2	335.5	227.5	108.0	2,770	0.345
95	6/4.5	1/4.5	95.40	111.3	13.5	4.5	385.2	261.2	124	3,180	0.301
120	30/2.3	7/2.3	124.7	153.8	16.1	6.9	573.7	345.7	228	5,540	0.233
160	30/2.6	7/2.6	159.3	196.5	18.2	7.8	732.8	441.5	291.3	6,980	0.182
*200	30/2.9	7/2.9	198.2	244.4	20.3	8.7	911.7	549.3	362.4	8,640	0.147
240	30/3.2	7/3.2	241.3	297.6	22.4	9.6	1,110	668.9	441.3	10,210	0.120
330	26/4.0	7/3.1	326.8	379.6	25.3	9.3	1,320	905.4	414.2	10,950	0.0888
410	26/4.5	7/3.5	413.4	480.8	28.5	10.5	1,673	1,145	527.9	13,910	0.0702
520	54/3.5	7/3.5	519.5	586.9	31.5	10.5	1,969	1,441	527.9	15,600	0.0559
610	54/3.8	7/3.8	612.4	691.8	34.2	11.4	2,320	1,698	627.3	18,350	0.0474
* 810	45/4.8	7/3.2	814.5	870.8	38.4	9.6	2,700	2,259	441.3	18,480	0.0356
* 950	84/3.8	7/3.8	952.6	1,032	41.8	11.4	3,271	2,649	622.2	23,100	0.0305
*1,160	84/4.2	7/4.2	1,163	1,260	46.2	12.6	3,996	3,236	759.8	27,830	0.025
*1,520	84/4.8	7/4.8	1,520	1,647	52.8	14.4	5,222	4,228	993.3	36,390	0.019

ACAR

ALUMINIUM CONDUCTORS ALLOY REINFORCED



Characteristics

- Aluminium Conductors with central core of Aluminium Alloy Wires
- ACAR offers excellent balance between mechanical & electrical properties.
- Excellent corrosion resistance owing to compatible materials in centre core and outer layers.
- A compromise choice between AAC, ACSR and AAAC and sometimes can be a line engineer's cheer.
- 1350 designates grade of pure Aluminium.
- 6201 designates Aluminium Alloy grade.

Recommended Stranding

Total No. of wires	No. of 1350 wires Alluminium		No. of 6201 wires At Alloy	
7	4/3	–	–	
19	15/4	12/7	–	–
37	33/4	30/7	24/13	18/19
61	54/7	48/13	42'19	33/28

Standing	Final modulus of elasticity Mpa	Coefficient of linear expansion '/°C
7	62000	23 x 10
19	60000	23 x 10
37	57000	23 x 10
61	54000	23 x 10

AAAC

BS 3242

Code Word	Stranding No,/mm	Calculated Sectional area mm^2	Overall diameter mm	Weight kg/km	Ultimate strength kg	Maximum resistance DC at 20°C ohm/km.
Almond	7/2.34	30.1	7.02	82	861	1.0940
Cedar	7/2.54	35.47	7.62	97	1014	0.9281
Fir	7/2.95	47.84	8.85	131	1366	0.6880
Hazel	7/3.30	59.87	9.90	164	1713	0.5498
Willow	7/4.04	89.8	12.12	246	2568	0.3667
Oak	7/4.65	118.9	13.95	325	3396	0.2769
Ash	19/3.48	180.7	17.40	497	5165	0.1830
Elm	19/3.76	211	18.80	580	6027	0.1568
Upas	37/3.53	362.1	24.71	997	10350	0.09155
Yew	37/4.06	479.9	28.42	1323	13715	0.06908

French Size NF34-125

Code Word	Calculated sectional area mm^2	Stranding No./mm	Overall diameter	Weight mm	Ultimate strength kg	Maximum DC resistance 20°C ohm/km.
ASTER 22	21.99	7/2.0	6	60.2	710	1.50
ASTER 34.4	34.36	7/2.5	7.5	94	1105	0.958
ASTER 54.6	54.55	7/3.15	9.45	149	1155	0.603
ASTER 75.5	75.54	19/2.25	11.25	208	2430	0.438
ASTER 117	116.98	19/2.8	14	322	3765	0.283
ASTER 148	148.01	19/3.15	15.75	407	4765	0.224
ASTER 181.6	181.62	37/2.5	17.5	500	5845	0.183
ASTER 228	227.83	37/2.8	19.6	627	7340	0.146
ASTER 288	288.34	37/3.15	22.05	794	9280	0.115
ASTER 366	366.22	37/3.55	24.85	1009	11785	0.0905
ASTER 570	570.22	61/3.45	31.05	1574	18360	0.0583
ASTER 851	850.66	91/3.45	37.95	2354	27390	0.0391
ASTER 1144	1143.51	91/4.0	44	3164	36260	0.0292
ASTER 1600	1595.93	127/4.0	52	4425	50640	0.0206

AAAC - DIN 48201

Norminal Size mm^2	Stranding No./mm	Calculated Section area mm^2	Overall diameter mm	Weight kg/mm	Ultimate Strength kg	Maximum DC resistance at 20°C ohm/km
16	7/1.70	15.89	5.10	44	450	2.0910
25	7/2.10	24.25	6.30	67	490	1.3703
35	7/2.50	34.36	7.50	94	980	0.9668
50	7/3.00	49.48	9.00	135	1410	0.6714
70	19/2.10	65.82	10.50	181	1875	0.5073
95	19/2.50	93.27	12.50	256	2660	0.3579
120	19/2.80	117.00	14.00	322	3325	0.2854
150	37/2.25	147.10	15.70	405	4190	0.2274
185	37/2.50	181.60	17.50	501	5175	0.1842
240	61/2.25	242.50	20.2	670	6910	0.1383
300	61/2.50	299.40	22.5	827	8535	0.1120
400	61/2.89	400.10	26.0	1105	11400	0.0838
500	61/3.23	499.8	29.1	1381	14245	0.0671
625	91/2.96	626.2	32.6	1733	17845	0.0537
800	91/3.35	802.1	36.8	2219	22860	0.0419
1000	91/3.74	999.7	41.1	2766	28490	0.0336

AACSR ALLUMINIUM ALLOY CONDUCTORS STEEL REINFORCED

AACSR - German - DIN 48206

Conductor size mm2	Alloy area mm2	Steel area mm2	Number of alloy wires	Diameter of alloy wire mm	Number of steel wire	Diameter of steel wire mm	Overall diameter of conductor mm	Weight kg/km	Ultimate Strength kg	Maximum DC resis-tance at 200 C ohm/km
16/2.5	15.27	2.54	6	1.80	1	1.80	5.4	62	748	2.1800
25/4	23.86	3.98	6	2.25	1	2.25	6.8	97	1171	1.3952
35/6	34.35	5.73	6	2.70	1	2.70	8.1	140	1685	0.9689
44/32	43.98	31.67	14	2.00	7	2.40	11.2	373	5027	0.7625
50/8	48.25	8.04	6	3.20	1	3.20	9.6	196	2366	0.6898
50/30	51.17	29.85	12	2.33	7	2.33	11.7	378	5024	0.6547
70/12	69.89	11.40	26	1.85	7	1.44	11.7	284	3399	0.4791
95/15	94.39	15.33	26	2.15	7	1.67	13.6	383	4582	0.3547
95/55	96.51	56.30	12	3.20	7	3.20	16.0	714	9475	0.3471
105/75	105.67	75.55	14	3.10	19	2.25	17.5	899	12014	0.3174
120/20	121.57	19.85	26	2.44	7	1.90	15.5	494	5914	0.2754
120/70	122.15	71.25	12	3.60	7	3.60	18.0	904	11912	0.2742
125/30	127.92	29.85	30	2.33	7	2.33	16.3	590	7280	0.2621
150/25	148.86	24.25	26	2.70	7	2.10	17.1	604	7236	0.2249
170/40	171.77	40.08	30	2.70	7	2.70	18.9	794	9775	0.1952
185/30	183.78	29.85	26	3.00	7	2.33	19.0	744	8922	0.1822
210/35	209.10	34.09	26	3.20	7	2.49	20.3	848	10167	0.1601
210/50	212.06	49.48	30	3.00	7	3.00	21.0	979	12068	0.1581
230/30	230.91	29.85	24	3.50	7	2.33	21.0	874	10308	0.1449
240/40	243.05	39.49	26	3.45	7	2.68	21.8	985	11802	0.1378
265/35	263.66	34.09	24	3.74	7	2.49	22.4	998	11771	0.1269
300/50	304.26	49.48	26	3.86	7	3.00	24.5	1233	14779	0.1101
305/40	304.62	39.49	54	2.68	7	2.68	24.1	1155	13612	0.1101
340/30	339.29	29.85	48	3.00	7	2.33	25.0	1174	13494	0.0988
380/50	381.70	49.48	54	3.00	7	3.00	27.0	1448	17056	0.0879
385/35	386.04	34.09	48	3.20	7	2.49	26.7	1336	15369	0.0868
435/55	434.29	56.30	54	3.20	7	3.20	28.8	1647	19406	0.0772
450/40	448.71	39.49	48	3.45	7	2.68	28.7	1553	17848	0.0747
490/65	490.28	63.55	54	3.40	7	3.40	30.6	1860	21907	0.0684
550/70	549.65	71.25	54	3.60	7	3.60	32.4	2085	24560	0.0610
560/50	561.70	49.48	48	3.86	7	3.00	32.2	1943	22348	0.0597
680/85	678.58	85.95	54	4.00	19	2.40	36.0	2564	30084	0.0494

AACSR (6201-T81) ASTM B711

Conductor size mm²	Alloy area mm²	Steel area mm²	Number of alloy wires	Diameter of alloy wire mm	Number of steel wires	Diameter of steel wire mm	Diameter of conductor mm	Weight kg/km	Ultimate strength Kg	Maximum DC resis-tance at 20°C ohm/km
163	140	23	26	2.62	7	2.04	16.6	560	7500	0.240
173	140	33	30	2.44	7	2.44	17.1	650	8740	0.240
186	160	26	26	2.80	7	2.18	17.7	645	8560	0.210
198	160	38	30	2.61	7	2.61	18.3	740	10600	0.210
209	180	29	26	2.97	7	2.31	18.8	725	9510	0.187
222	180	42	30	2.76	7	2.76	19.3	825	11200	0.187
232	200	32	26	3.13	7	2.43	19.8	800	10600	0.168
247	200	47	30	2.91	7	2.91	20.4	920	12400	0.168
260	224	36	26	3.31	7	2.57	21.0	900	11800	0.150
276	224	52	30	3.08	7	3.08	21.6	1025	13900	0.150
291	250	41	26	3.50	7	2.72	22.2	1010	12900	0.135
308	250	58	30	3.26	7	3.26	22.8	1145	15600	0.135
326	280	46	26	3.70	7	2.88	23.4	1140	14400	0.120
345	280	65	30	3.45	7	3.45	24.2	1280	17100	0.120
367	315	52	26	3.93	19	3.06	24.9	1276	16300	0.107
387	315	72	30	3.66	7	2.20	25.6	1433	19000	0.107
413	355	58	26	4.17	19	3.24	26.4	1433	18300	0.0950
436	355	81	30	3.88	7	2.33	27.2	1614	21100	0.0950
465	400	65	26	4.43	19	3.45	28.1	1612	20700	0.0842
491	400	91	30	4.12	19	2.47	28.8	1816	23700	0.0842
509	450	59	54	3.26	19	1.98	29.5	1703	21500	0.0748
563	500	63	54	3.43	19	2.06	30.9	1873	22900	0.0673
631	560	71	54	3.63	19	2.18	32.7	2101	25700	0.0601
710	630	80	54	3.85	19	2.31	34.6	2365	28600	0.05343
800	710	90	54	4.09	19	2.45	36.8	2665	32200	0.0474
901	800	101	54	4.34	19	2.60	39.0	3000	36300	0.0420
973	900	73	84	3.69	19	2.21	40.6	3062	35500	0.03740
1081	1000	81	84	3.89	19	2.33	42.8	3395	39100	0.0337
1211	1120	91	84	4.12	19	2.47	45.3	3803	43900	0.0300
1352	1250	102	84	4.35	19	2.61	47.8	4250	49000	0.0270

ALUMINIUM CONDUCTORS ALLOY REINFORCED

Canadian Size - CSA C49.1 - M87

Code wire mm²	Diameter of conductor mm	Diameter of wires mm	Number of wires A1	Number mm2 A2	Area mm2 A1	Area A2	Total area mm²	Weight Kg/km	Ultimate strength Kg	Maximum DC resis-tance at 20°C ohm/km
10	1.39	4.17	4	3	6.08	4.56	10.65	29.1	253	2.863299
16	1.76	5.28	4	3	9.73	7.30	17.04	46.6	401	1.789562
25	2.20	6.60	4	3	15.21	11.41	26.62	72.8	619	1.145320
40	2.78	8.35	4	3	24.34	18.25	42.59	116.5	954	0.715825
63	3.49	10.48	4	3	38.33	28.75	67.08	183.5	1484	0.454492
100	4.40	13.20	4	3	60.84	45.63	106.47	291.3	2326	0.286330
125	4.92	14.76	4	3	76.05	57.04	133.09	364.1	2907	0.229064
160	3.36	16.82	12	7	106.67	62.23	168.90	464.4	3616	0.179821
200	3.76	18.81	12	7	133.34	77.78	211.12	580.5	4453	0.143857
250	4.21	21.03	12	7	166.68	97.23	263.90	725.7	5567	0.115085
250	3.04	21.31	18	19	131.05	138.33	269.38	742.1	6235	0.115364
315	3.34	23.37	30	7	262.70	61.30	324.00	893.7	6241	0.091559
315	3.42	23.92	18	19	165.12	174.29	339.42	935.1	7857	0.091559
400	3.76	26.34	30	7	333.59	77.84	411.42	1134.8	7759	0.072102
400	3.85	26.96	18	19	209.68	221.33	431.00	1187.4	9872	0.072102
450	3.99	27.94	30	7	375.28	87.57	462.85	1276.7	8729	0.064091
450	4.08	28.59	18	19	235.89	248.99	484.88	1335.8	11106	0.064091
500	4.21	29.45	30	7	416.98	97.30	514.28	1418.5	9699	0.057682
500	4.31	30.14	18	19	262.10	276.66	538.76	1484.3	12340	0.057682
560	4.45	31.16	30	7	467.02	108.97	575.99	1588.8	10863	0.051502
560	4.56	31.90	18	19	293.55	309.86	603.41	1662.4	13821	0.051502
560	3.45	31.04	54	7	504.32	65.38	569.70	1574.2	10467	0.051579
630	4.72	33.05	30	7	525.40	122.59	647.99	1787.3	12221	0.045779
630	4.83	33.83	18	19	330.24	348.59	678.83	1870.2	15549	0.045779
710	3.94	35.45	42	19	511.84	231.54	743.38	2052.6	15154	0.040682
710	4.02	36.20	24	37	304.92	470.08	775.00	2137.6	18651	0.040682
800	4.18	37.63	42	19	576.72	260.90	837.61	2312.8	17075	0.036105
800	4.27	38.42	24	37	343.57	529.67	873.24	2408.5	21016	0.036105
900	4.43	39.91	42	19	648.81	293.51	942.31	2601.9	19209	0.032093
900	4.53	40.75	24	37	386.52	595.88	982.40	2709.6	23643	0.032093
1000	4.67	42.07	42	19	720.90	326.12	1047.02	2891.0	21344	0.028884
1000	4.77	42.96	24	37	429.46	662.09	1091.56	3010.7	26270	0.028884
1000	3.85	42.39	54	37	629.83	431.55	1061.37	2932.6	22896	0.028914
1120	4.02	44.23	72	19	914.08	241.22	1155.30	3194.4	22071	0.025816
1120	4.08	44.86	54	37	705.40	483.33	1188.74	3284.5	25643	0.025816
1250	4.25	46.72	72	19	1020.18	269.21	1289.39	3565.2	24633	0.023131
1250	4.31	47.39	54	37	787.28	539.43	1326.72	3665.7	28620	0.023131
1400	4.50	49.45	72	19	1142.60	301.52	1444.12	3993.1	27589	0.020653
1400	4.56	50.16	54	37	881.76	604.17	1485.92	4105.6	32054	0.020653
1500	4.65	51.18	72	19	1224.22	323.06	1547.27	4278.3	29560	0.019276
1500	4.72	51.92	54	37	944.74	647.32	1592.06	4398.9	34344	0.019276
1600	4.81	52.86	72	19	1305.83	344.59	1650.43	4563.5	31530	0.018071
1600	4.87	53.62	54	37	1007.72	690.48	1698.20	4692.1	36633	0.018071

Note : A1 : 1350-H19 Aluminium wire A2 : 6101-T81 Aluminium alloy wire

USA Size - ASTM B524 (Contd.)

Size of conductor Kcmil	Cross Section Square Inch	Stranding 1350-H19	Stranding 6201-T81	Outside diameter Inch	Area mm²	Diameter of wire	Overall Diameter of conductor mm	Weight kg/km	Ultimate strength kg	Maximum DC resis-tance at 20°C ohm/km
30.6	0.0240	4x0.0661	3x0.0661	0.198	15.5	1.679	5.03	43	367	1.983
4	0.0328	4x0.0772	3x0.0772	0.232	21.2	1.961	5.89	59	498	1.454
48.7	0.0382	4x0.0834	3x0.0834	0.250	24.7	2.118	6.35	68	573	1.246
2	0.0521	4x0.0974	3x0.0974	0.292	33.6	2.474	7.42	93	777	0.913
77.5	0.0608	4x0.1052	3x0.1052	0.316	39.3	2.672	8.03	109	893	0.721
1/0	0.0829	4x0.1228	3x0.1228	0.368	53.5	3.119	9.35	148	1195	0.575
123.3	0.0968	4x0.1327	3x0.1327	0.398	62.5	3.371	10.11	173	1395	0.492
2/0	0.1045	4x0.1379	3x0.1379	0.414	67.4	3.503	10.52	187	1470	0.455
155.4	0.1221	4x0.1490	3x0.1490	0.447	78.7	3.785	11.35	218	1700	0.390
3/0	0.1317	4x0.1548	3x0.1548	0.464	85	3.932	11.80	235	1820	0.361
195.7	0.1537	4x0.1672	3x0.1672	0.502	99.1	4.247	12.74	274	2130	0.310
4/0	0.1663	4x0.1739	3x0.1739	0.522	107	4.417	13.25	297	2300	0.286
246.9	0.1939	4x0.1878	3x0.1878	0.563	125	4.77	14.31	346	2682	0.245
250.	0.1963	15x0.1147	4x0.1147	0.574	127	2.913	14.56	350	2430	0.235
250.	0.1963	12x0.1147	7x0.1147	0.574	127	2.913	14.56	350	2750	0.240
300.	0.2358	15x0.1257	4x0.1257	0.629	152	3.193	15.96	420	2885	0.195
300.	0.2358	12x0.1257	7x0.1257	0.629	152	3.193	15.96	420	3275	0.200
350.	0.2748	15x0.1357	4x0.1357	0.679	177	3.447	17.24	490	3315	0.168
350.	0.2748	12x0.1357	7x0.1357	0.679	177	3.447	17.24	490	3735	0.172
400	0.3142	15x0.1451	4x0.1451	0.726	203	3.685	18.44	560	3745	0.147
400.	0.3142	12x0.1451	7x0.1451	0.726	203	3.685	18.44	560	4230	0.135
450.	0.3534	15x0.1539	4x0.1539	0.770	228	3.909	19.55	630	4150	0.130
450.	0.3534	12x0.1539	7x0.1539	0.770	228	3.909	19.55	630	4710	0.133
500	0.3926	15x0.1622	4x0.1622	0.811	253	4.120	20.60	700	4620	0.117
500	0.3926	12x0.1622	7x0.1622	0.811	253	4.120	20.60	700	5240	0.120
500	0.3924	33x0.1162	4x0.1162	0.813	253	2.951	20.65	700	4440	0.116
500	0.3924	30x0.1162	7x0.1162	0.813	253	2.951	20.65	700	4795	0.117
500	0.3924	24x0.1162	13x0.1162	0.813	253	2.951	20.65	700	5285	0.120
500	0.3924	18x0.1162	19x0.1162	0.813	253	2.951	20.65	700	5860	0.123
550.	0.4318	15x0.1701	4x0.1701	0.851	279	4.321	21.66	770	5060	0.107
550.	0.4318	12x0.1701	7x0.1701	0.851	279	4.321	21.66	770	5770	0.110
550	0.4320	33x0.1219	4x0.1219	0.853	279	2.951	21.66	770	4800	0.105
550	0.4320	30x0.1219	7x0.1219	0.853	279	2.951	21.66	770	5195	0.106
550	0.4320	24x0.1219	13x0.1219	0.853	279	2.951	21.66	770	5730	0.109
550	0.4320	18x0.1219	19x0.1219	0.853	279	2.951	21.66	770	6395	0.111
600	0.4712	15x0.1777	4x0.1777	0.889	304	4.513	22.58	840	5550	0.0978
600	0.4712	12x0.1777	7x0.1777	0.889	304	4.513	22.58	840	6260	0.100
600	0.4709	33x0.1273	4x0.1273	0.891	304	3.23	22.63	840	5240	0.096
600	0.4709	30x0.1273	7x0.1273	0.891	304	3.23	22.63	840	5680	0.097
600	0.4709	24x0.1273	13x0.1273	0.891	304	3.23	22.63	840	6260	0.100
600	0.4709	18x0.1273	19x0.1273	0.891	304	3.23	22.63	840	7020	0.102
650	0.5102	33x0.1325	4x0.1325	0.928	329	3.36	23.57	910	5680	0.089
650	0.5102	30x0.1325	7x0.1325	0.928	329	3.36	23.57	910	6130	0.090
650	0.5102	24x0.1325	13x0.1325	0.928	329	3.36	23.57	910	6800	0.092
650	0.5102	18x0.1325	19x0.1325	0.928	329	3.36	23.57	910	7600	0.095
700	0.5494	33x0.1375	4x0.1375	0.963	355	3.49	24.46	980	6040	0.083
700	0.5494	30x0.1375	7x0.1375	0.963	355	3.49	24.46	980	6530	0.084
700	0.5494	24x0.1375	13x0.1375	0.963	355	3.49	24.46	980	7150	0.086
700	0.5494	18x0.1375	19x0.1375	0.963	355	3.49	24.46	980	7950	0.088
750	0.5892	33x0.1424	4x0.1424	0.997	380	3.62	25.32	1050	6400	0.077
750	0.5892	30x0.1424	7x0.1424	0.997	380	3.62	25.32	1050	6930	0.078
750	0.5892	24x0.1424	13x0.1424	0.997	380	3.62	25.32	1050	7600	0.080
750	0.5892	18x0.1424	19x0.1424	0.997	380	3.62	25.32	1050	8440	0.082

Size of conductor		Stranding		Outside diameter	Area	Diameter of wire	Overall Diameter of conductor	Weight	Ultimate strength	Maximum DC resistance at 20°C
Kcmil	Cross Section Square Inch	1350-H19	6201-T81	Inch	mm²		mm	kg/km	kg	ohm/km
800	0.6280	33x0.1470	4x0.1470	1.029	405	3.73	26.15	1120	6800	0.072
800	0.6280	30x0.1470	7x0.1470	1.029	405	3.73	26.15	1120	7370	0.073
800	0.6280	24x0.1470	13x0.1470	1.029	405	3.73	26.15	1120	8080	0.075
800	0.6280	18x0.1470	19x0.1470	1.029	405	3.73	26.15	1120	9010	0.077
850	0.6679	33x0.1516	4x0.1516	1.061	431	3.85	26.95	1190	7100	0.068
850	0.6679	30x0.1516	7x0.1516	1.061	431	3.85	26.95	1190	7720	0.069
850	0.6679	24x0.1516	13x0.1516	1.061	431	3.85	26.95	1190	8530	0.071
850	0.6679	18x0.1516	19x0.1516	1.061	431	3.85	26.95	1190	9500	0.072
900	0.7072	33x0.1560	4x0.1560	1.092	456	3.96	27.75	1260	7550	0.064
900	0.7072	30x0.1560	7x0.1560	1.092	456	3.96	27.75	1260	8170	0.065
900	0.7072	24x0.1560	13x0.1560	1.092	456	3.96	27.75	1260	9015	0.067
900	0.7072	18x0.1560	19x0.1560	1.092	456	3.96	27.75	1260	9950	0.068
950	0.7458	33x0.1602	4x0.1602	1.121	481	4.07	28.50	1330	7950	0.061
950	0.7458	30x0.1602	7x0.1602	1.121	481	4.07	28.50	1330	8610	0.062
950	0.7458	24x0.1602	134x0.1602	1.121	481	4.07	28.50	1330	9500	0.063
950	0.7458	18x0.1602	19x0.1602	1.121	481	4.07	28.50	1330	10610	0.065
1.000	0.7853	33x0.1644	4x0.1644	1.151	507	4.17	29.30	1400	8390	0.058
1.000	0.7853	30x0.1644	7x0.1644	1.151	507	4.17	29.30	1400	9060	0.059
1.000	0.7853	24x0.1644	13x0.1644	1.151	507	4.17	29.30	1400	10030	0.060
1.000	0.7853	18x0.1644	19x0.1644	1.151	507	4.17	29.30	1400	11190	0.061
1.000	0.7849	54x0.1280	7x0.1280	1.152	507	3.25	29.32	1397	8750	0.058
1.000	0.7849	48x0.1280	13x0.1280	1.152	507	3.25	29.32	1397	9370	0.059
1.000	0.7849	42x0.1280	19x0.1280	1.152	507	3.25	29.32	1397	10170	0.060
1.000	0.7849	33x0.1280	28x0.1280	1.152	507	3.25	29.32	1397	12210	0.061
1.100	0.8637	33x0.1724	4x0.1724	1.207	557	4.38	30.65	1540	9190	0.053
1.100	0.8637	30x0.1724	7x0.1724	1.207	557	4.38	30.65	1540	9990	0.053
1.100	0.8637	24x0.1724	13x0.1724	1.207	557	4.38	30.65	1540	11010	0.054
1.100	0.8637	18x0.1724	19x0.1724	1.207	557	4.38	30.65	1540	12300	0.056
1.100	0.8641	54x0.1343	7x0.1343	1.209	557	3.41	30.70	1540	9590	0.053
1.100	0.8641	48x0.1343	13x0.1343	1.209	557	3.41	30.70	1540	10170	0.054
1.100	0.8641	42x0.1343	19x0.1343	1.209	557	3.41	30.70	1540	11070	0.055
1.100	0.8641	33x0.1343	28x0.1343	1.209	557	3.41	30.70	1540	11810	0.055
1.200	0.9426	33x0.1801	4x0.1801	1.261	608	4.57	32.0	1680	10030	0.048
1.200	0.9426	30x0.1801	7x0.1801	1.261	608	4.57	32.0	1680	10880	0.049
1.200	0.9426	24x0.1801	13x0.1801	1.261	608	4.57	32.0	1680	12035	0.05
1.200	0.9426	18x0.1801	19x0.1801	1.261	608	4.57	32.0	1680	13400	0.051
1.200	0.9430	54x0.1403	7x0.1403	1.263	608	3.56	32.10	1680	10260	0.048
1.200	0.9430	48x0.1403	13x0.1403	1.263	608	3.56	32.10	1680	10970	0.049
1.200	0.9430	42x0.1403	19x0.1403	1.263	608	3.56	32.10	1680	11860	0.05
1.200	0.9430	33x0.1403	28x0.1403	1.263	608	3.56	32.10	1680	12790	0.051
1.250	0.9817	33x0.1838	4x0.1838	1.287	633	4.67	32.70	1750	10480	0.046
1.250	0.9817	30x0.1838	7x0.1838	1.287	633	4.67	32.70	1750	11370	0.047
1.250	0.9817	24x0.1838	13x0.1838	1.287	633	4.67	32.70	1750	12520	0.048
1.250	0.9817	18x0.1838	19x0.1838	1.287	633	4.67	32.70	1750	13990	0.049
1.250	0.9810	54x0.1431	7x0.1431	1.288	633	3.63	32.72	1750	10700	0.046
1.250	0.9810	48x0.1431	13x0.1431	1.288	633	3.63	32.72	1750	11400	0.047
1.250	0.9810	42x0.1431	19x0.1431	1.288	633	3.63	32.72	1750	12340	0.048
1.250	0.9810	33x0.1431	28x0.1431	1.288	633	3.63	32.72	1750	13320	0.049
1.300	1.0205	33x0.1874	4x0.1874	1.312	659	4.76	33.33	1820	10880	0.044
1.300	1.0205	30x0.1874	7x0.1874	1.312	659	4.76	33.33	1820	11810	0.045
1.300	1.0205	24x0.1874	13x0.1874	1.312	659	4.76	33.33	1820	13000	0.046
1.300	1.0205	18x0.1874	19x0.1874	1.312	659	4.76	33.33	1820	14520	0.047

Size of conductor		Stranding		Outside diameter	Area	Diameter of wire	Overall Diameter of conductor	Weight	Ultimate strength	Maximum DC resistance at 20°C
Kcmil	Cross Section Square Inch	1350-H19	6201-T81	Inch	mm²		mm	kg/km	kg	ohm/km
1.300	1.0212	54x0.1460	7x0.1460	1.314	659	3.71	33.38	1825	11150	0.044
1.300	1.0212	48x0.1460	13x0.1460	1.314	659	3.71	33.38	1825	11900	0.045
1.300	1.0212	42x0.1460	19x0.1460	1.314	659	3.71	33.38	1825	12830	0.046
1.300	1.0212	33x0.1460	28x0.1460	1.314	659	3.71	33.38	1825	13850	0.047
1.400	1.0996	54x0.1515	7x0.1515	1.364	709	3.85	34.65	1960	11770	0.041
1.400	1.0996	48x0.1515	13x0.1515	1.364	709	3.85	34.65	1960	12600	0.042
1.400	1.0996	42x0.1515	19x0.1515	1.364	709	3.85	34.65	1960	13670	0.043
1.400	1.0996	33x0.1515	28x0.1515	1.364	709	3.85	34.65	1960	14790	0.044
1,500	1.1779	54x0.1568	7x0.1568	1.411	760	3.98	35.85	2100	12610	0.039
1,500	1.1779	48x0.1568	13x0.1568	1.411	760	3.98	35.85	2100	13500	0.0395
1,500	1.1779	42x0.1568	19x0.1568	1.411	760	3.98	35.85	2100	14650	0.040
1,500	1.1779	33x0.1568	28x0.1568	1.411	760	3.98	35.85	2100	15850	0.041
1,600	1.2573	54x0.1620	7x0.1620	1.458	811	4.11	37.05	2240	13500	0.036
1,600	1.2573	48x0.1620	13x0.1620	1.458	811	4.11	37.05	2240	14430	0.037
1,600	1.2573	42x0.1620	19x0.1620	1.458	811	4.11	37.05	2240	15630	0.037
1,600	1.2573	33x0.1620	28x0.1620	1.458	811	4.11		2240	16920	0.038
1,700	1.3345	54x0.1669	7x0.1669	1.502	861	4.24	38.15	2380	14300	0.034
1,700	1.3345	48x0.1669	13x0.1669	1.502	861	4.24	38.15	2380	15320	0.0345
1,700	1.3345	42x0.1669	19x0.1669	1.502	861	4.24	38.15	2380	16610	0.035
1,700	1.3345	33x0.1669	28x0.1669	1.502	861	4.24	38.15	2380	17990	0.036
1,750	1.3750	54x0.1694	7x0.1694	1.525	887	4.30	38.75	2450	14750	0.033
1,750	1.3750	48x0.1694	13x0.1694	1.525	887	4.30	38.75	2450	15760	0.0335
1,750	1.3750	42x0.1694	19x0.1694	1.525	887	4.30	38.75	2450	17100	0.034
1,750	1.3750	33x0.1694	28x0.1694	1.525	887	4.30	38.75	2450	18520	0.035
1,800	1.4140	54x0.1718	7x0.1718	1.546	912	4.36	39.30	2520	15140	0.032
1,800	1.4140	48x0.1718	13x0.1718	1.546	912	4.36	39.30	2520	16210	0.0325
1,800	1.4140	42x0.1718	19x0.1718	1.546	912	4.36	39.30	2520	17590	0.033
1,800	1.4140	33x0.1718	28x0.1718	1.546	912	4.36	39.30	2520	19050	0.034
1,900	1.4924	54x0.1765	7x0.1765	1.589	963	4.48	40.35	2660	15990	0.0305
1,900	1.4924	48x0.1765	13x0.1765	1.589	963	4.48	40.35	2660	17140	0.031
1,900	1.4924	42x0.1765	19x0.1765	1.589	963	4.48	40.35	2660	18560	0.0315
1,900	1.4924	33x0.1765	28x0.1765	1.589	963	4.48	40.35	2660	20120	0.032
2,000	1.5713	54x0.1811	7x0.1811	1.630	1013	4.60	41.40	2800	16830	0.029
2,000	1.5713	48x0.1811	13x0.1811	1.630	1013	4.60	41.40	2800	18030	0.0295
2,000	1.5713	42x0.1811	19x0.1811	1.630	1013	4.60	41.40	2800	19540	0.030
2,000	1.5713	33x0.1811	28x0.1811	1.630	1013	4.60	41.40	2800	21140	0.0305
2,000	1.5700	72x0.1482	19x0.1482	1.630	1013	3.76	41.40	2795	18210	0.0295
2,000	1.5700	63x0.1482	28x0.1482	1.630	1013	3.76	41.40	2795	19275	0.0300
2,000	1.5700	54x0.1482	37x0.1482	1.630	1013	3.76	41.40	2795	20695	0.0305
2,250	1.7660	72x0.1572	19x0.1572	1.729	1140	3.99	43.90	3175	20200	0.0265
2,250	1.7660	63x0.1572	28x0.1572	1.729	1140	3.99	43.90	3175	21450	0.0267
2,250	1.7660	54x0.1572	37x0.1572	1.729	1140	3.99	43.90	3175	23050	0.027
2,500	1.9620	72x0.1657	19x0.1657	1.823	1267	4.21	46.30	3530	22470	0.023
2,500	1.9620	63x0.1657	28x0.1657	1.823	1267	4.21	46.30	3530	23850	0.024
2,500	1.9620	54x0.1657	37x0.1657	1.823	1267	4.21	46.30	3530	25625	0.0245
2,750	2.1590	72x0.1738	19x0.1738	1.912	1393	4.41	48.55	3880	24690	0.0215
2,750	2.1590	63x0.1738	28x0.1738	1.912	1393	4.41	48.55	3880	26200	0.0220
2,750	2.1590	54x0.1738	37x0.1738	1.912	1393	4.41	48.55	3880	28200	0.0222
3,000	2.3570	72x0.1816	19x0.1816	1.998	1520	4.61	50.75	4240	26950	0.0197
3,000	2.3570	63x0.1816	28x0.1816	1.998	1520	4.61	50.75	4240	28640	0.0200
3,000	2.3570	54x0.1816	37x0.1816	1.998	1520	4.61	50.75	4240	30770	0.0203

ACSR/AS

3. BS 215 : Part 2 : 1970

code word	Conductor size	Stranding Nos./mm		Calculated sectional area mm²		Overall diameter mm		Weight kg/km			Ultimate strength		Calculated electrical resistance at 20°C
	mm2	Alumi-nium	AS	Alumi-nium	ACSR/AS	ACSR/AS	AS	ACSR/AS	Alumi-nium	AS	kN	kg	ohm/km
Gopher	25	6/2.36	1/2.36	26.24	30.62	7.08	2.36	100.8	72.0	28.8	9.90	1,010	1.035
Weasel	30	6/2.59	1/2.59	31.61	36.88	7.77	2.59	121.4	86.7	34.7	11.79	1,200	0.8592
Ferret	40	6/3.00	1/3.00	42.41	49.48	9.00	3.00	163.0	116.4	46.6	15.69	1,600	0.6404
Rabbit	50	6/3.35	1/3.35	52.88	61.70	10.05	3.35	203.2	145.1	58.1	19.05	1,940	0.5136
Horse	70	12/2.79	7/2.79	73.37	116.2	13.95	8.37	486.0	202.7	283.3	64.06	6,530	0.3286
Dog	100	6/4.72	7/1.57	105.0	118.5	14.15	4.71	377.8	288.1	89.7	32.98	3,360	0.2619
Wolf	150	30/2.59	7/2.59	158.1	194.9	18.13	7.77	680.7	436.7	244.0	71.58	7,300	0.1694
Dingo	150	18/3.35	1/3.35	158.7	167.5	16.75	3.35	495.0	436.7	58.1	36.37	3,710	0.1781
Lynx	175	30/2.79	7/2.79	183.4	226.2	19.53	8.37	790.3	507.0	283.3	82.61	8,420	0.146
Caracal	175	18/3.61	1/3.61	184.3	194.5	18.05	3.61	575.0	507.5	67.5	41.46	4,230	0.1534
Panthar	200	30/3.00	7/3.00	212.1	261.5	21.00	9.00	913.7	586.1	327.6	95.42	9,730	0.1263
Jaguar	200	18/3.86	1/3.86	210.6	222.3	19.30	3.86	657.2	580.1	77.1	46.56	4,750	0.1342
Zebra	400	54/3.18	7/3.18	428.9	484.5	28.62	9.54	1,554	1,185.8	368.1	137.9	14,060	0.06456

ACSR/AS

Semistandard Size

code word	Conductor size	Stranding Nos./mm		Calculated sectional area mm²		Overall diameter mm		Weight kg/km			Ultimate strength		Calculated electrical resistance at 20°C
	mm2	Alumi-nium	AS	Alumi-nium	ACSR/AS	ACSR/AS	AS	ACSR/AS	Alumi-nium	AS	kN	kg	ohm/km
Fox	35	6/2.79	1/2.79	36.68	42.80	8.37	2.79	141.0	100.7	40.3	13.58	1,380	0.7404
Mink	60	6/3.66	1/3.66	63.12	72.64	10.98	3.66	242.5	173.2	69.3	21.06	2,150	0.4325
Shunk	60	12/2.59	7/2.59	63.23	100.1	12.95	7.77	418.6	174.6	244.0	55.35	5,640	0.3813
Beaver	75	6/3.99	1/3.99	75.00	87.50	11.97	3.99	288.2	205.8	82.4	25.73	2,620	0.3621
Raccoon	75	6/4.09	1/4.09	78.84	91.98	12.27	4.09	302.9	216.3	86.6	27.05	2,760	0.3445
Otter	80	6/4.22	1/4.22	83.94	97.93	12.66	4.22	322.5	230.3	92.2	28.39	2,890	0.3236
Cat	95	6/4.50	1/4.50	95.40	111.3	13.50	4.50	366.6	261.8	104.8	31.54	3,220	0.2847
Hare	105	6/4.72	1/4.72	105.0	122.5	14.16	4.72	403.4	288.1	115.3	34.20	3,490	0.2587
Hyena	105	7/4.39	7/1.93	106.0	126.5	14.57	5.79	426.4	290.8	135.6	41.58	4,240	0.2544
Leopard	130	6/5.28	7/1.75	131.4	148.2	15.81	5.25	472.0	360.5	111.5	41.15	4,200	0.2093
Tiger	130	30/2.36	7/2.36	131.2	161.8	16.52	7.08	565.2	362.5	202.7	60.01	6,120	0.2041
Coyote	130	26/2.54	7/1.91	131.7	151.8	15.89	5.73	496.7	363.9	132.8	46.90	4,780	0.2072
Lion	235	30/3.18	7/3.18	238.3	293.9	22.26	9.54	1,027	658.5	368.1	106.4	10,850	0.1124
Bear	260	30/3.35	7/3.35	264.4	326.1	23.45	10.05	1,139	730.6	408.5	116.0	11,820	0.1013
Batang	300	18/4.78	7/1.68	323.1	338.6	24.16	5.04	992.6	889.9	102.7	70.06	7,140	0.08783
Goat	320	30/3.71	7/3.71	324.3	400.0	25.97	11.13	1,397	896.2	500.9	135.7	13,840	0.08256
Antelope	370	54/2.97	7/2.97	374.1	422.6	26.73	8.91	1,356	1,034.50	321.0	121.7	12,410	0.07402
Sheep	375	30/3.99	7/3.99	375.0	462.5	27.93	11.97	1,616	1,036.3	579.4	156.1	15,920	0.0714
Bison	380	54/3.00	7/3.00	381.7	431.2	27.00	9.00	1,383	1,055.4	327.6	124.2	12,670	0.07254
Deer	425	30/4.27	7/4.27	429.6	529.8	29.89	12.81	1,851	1,187.2	663.6	175.4	17,890	0.06233
Camel	475	54/3.35	7/3.35	476.0	537.7	30.15	10.05	1,724	1,315.60	408.5	150.7	15,360	0.05817
Elk	475	30/4.50	7/4.50	477.0	588.3	31.50	13.50	2,055	1,318.2	737.0	190.4	19,420	0.05613
Moose	525	54/3.53	7/3.53	528.5	597.0	31.77	10.59	1,914	1,460.80	453.5	163.5	16,680	0.05239

ACSR/AS

ALUMINIUM CONDUCTOR ALUMINIUM-CLAD STEEL REINFORCED

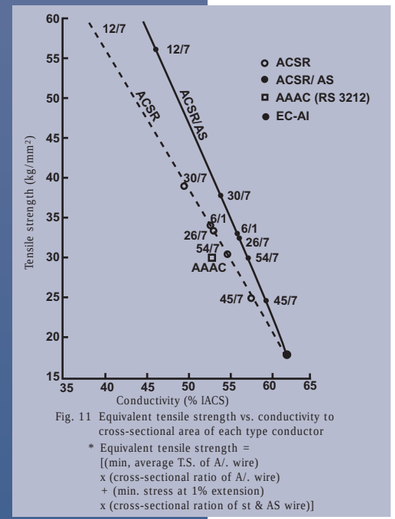


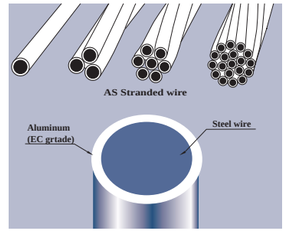
Fig. 11 Equivalent tensile strength vs. conductivity to cross-sectional area of each type conductor

* Equivalent tensile strength = [(min. average T.S. of A/. wire) x (cross-sectional ratio of A/. wire) + (min. stress at 1% extension) x (cross-sectional ration of st & AS wire)]

ACSR/AS is identical to conventional ACSR with only difference in the core where AS wires are substituted for galvanised steel wires. It has better properties in many instances as compared to conventional conductor.

ACSR/AS has the following advantages as compared to conventional ACSR

- Reduced power loss
- High Corrosion resistance
- Less weight
- Higher weight to strength ratios

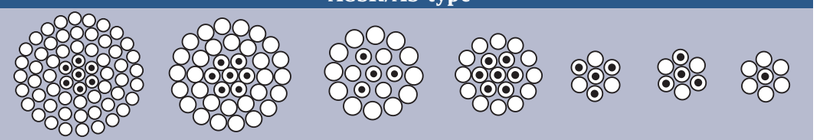


Properties of various types of conductors can be compared as hereunder for same diameter conductors.

Item	AAC	AAAC	ACSR	ACSR/AS
1. Corrosion resistances	Better	Good	Standard	Better
2. Tensile strength	Poor	Standard	Better	Better
3. Conductivity	Better	Good	Standard	Good
4. Creep strain under the current loading (i.e. high temperature)	Standard	Poor	Better	Better
5. Weight	Better	Better	Standard	Good
6. Sag characteristics under the same factor to breaking of conductor.	Poor	Standard	Better	Better
7. Available max. span length	Poor	Standard	Better	Better

Corrosion of ACSR with galvanised steel central core wires is hastened due to galvanic effect because of contact of Zinc with Aluminium. First Zinc is corroded and then aluminium wire, owing to contact of Aluminium and Steel. Since the material of aluminium exists on periphery, there is no galvanic action and as a result superb corrosion resistance is obtained.

ACSR/AS type



(54 A1/7 AS) (30 A1/7 AS) (15 A1/4 AS) (12 A1/7 AS) (3 A1/4 AS) (4 A1/3 AS) (6 A1/1 AS)

ACSR/AS

ASTM B549-82 (Contd)... Metric System

ACSR/AS code word	Conductor size CM or AWG	Stranding Nos./mm Alumi-nium	Stranding Nos./mm AS wire	Calculated sectional area mm² Alumi-nium	Calculated sectional area mm² AS wire	Overall diameter mm ACSR AS	Overall diameter mm AS core	Weight kg/mm Alumi-mum	Weight kg/mm AS core	Weight kg/mm ACSR/ AS	Ultimate strength kg	Calculated D.C. resistance at 20°C Ω/km
Osprey	556,500	18/4.465	1/4.465	282.0	15.66	22.33	4.465	777.0	103.2	880.2	6,000	0.1004
Hen	477,000	30/3.203	7/3.203	241.7	56.41	22.42	9.609	671.4	373.6	1.045	10,610	0.1114
Hawk	477,000	26/3.439	7/2.675	241.7	39.34	21.78	8.025	669.2	260.3	929.5	8,590	0.1137
Flicker	477,000	24/3.581	7/2.388	241.7	31.35	21.48	7.164	669.6	207.4	877	7,570	0.1148
Pelican	477,000	18/4.135	1/4.135	241.7	13.43	20.68	4.135	666.5	88.50	755	5,190	0.1171
Lark	397,500	30/2.924	7/2.924	201.4	47.01	20.47	8.772	559.5	311.3	870.8	8,900	0.1336
Ibis	397,500	26/3.139	7/2.441	201.4	32.76	19.88	7.323	557.5	216.7	774.2	7,150	0.1365
Brant	397,500	24/3.269	7/2.179	201.4	26.10	19.61	6.537	558.2	172.7	730.9	6,370	0.1378
Chickadee	397,500	18/3.774	1/3.774	201.4	11.19	18.87	3.774	555.2	73.72	628.9	4,420	0.1405
Oriole	336,400	30/2.690	7/2.690	170.5	39.78	18.83	8.070	473.5	263.5	737	7,590	0.1579
Linnet	336,400	26/2.888	7/2.245	170.5	27.71	18.28	6.735	472	183.3	655.3	6,110	0.1612
Merlin	336,400	18/3.472	1/3.472	170.5	9.468	17.36	3.472	469.8	62.39	532.2	3,870	0.1661
Ostrich	300,000	26/2.728	7/2.121	152.0	24.73	17.27	6.363	421.1	163.6	584.7	5,500	0.1807
Partridge	266,800	26/2.573	7/2.002	135.2	22.04	16.29	6.006	374.4	145.8	520.2	4,900	0.2031
Waxwing	266,800	18/3.091	1/3.091	135.2	7.504	15.46	3.091	372.3	49.45	421.8	3,090	0.2095
Penguin	(4/0)	6/4.770	1/4.770	107.2	17.87	14.31	4.770	294.1	117.8	411.9	3,480	0.2534
Pigeon	(3/0)	6/4.247	1/4.247	85.03	14.17	12.74	4.247	233.2	93.36	326.6	2,850	0.3196
Quail	(2/0)	6/3.782	1/3.782	67.44	11.23	11.35	3.782	185.0	74.03	259	2,320	0.4030
Raven	(1/0)	6/3.371	1/3.371	53.51	8.925	10.11	3.371	146.9	58.81	205.7	1,930	0.5072
Robin	(1)	6/3.000	1/3.000	42.41	7.069	9.000	3.000	116.4	46.58	163	1,560	0.6404
Sparate	(2)	7/2.474	1/3.299	33.64	8.548	8.247	3.299	92.29	56.33	148.6	1,590	0.7852
Sparrow	(2)	6/2.672	1/2.672	33.63	5.607	8.016	2.672	92.32	36.95	129.3	1,250	0.8073
Swanate	(4)	7/1.961	1/2.614	21.15	5.367	6.536	2.614	58.01	35.37	93.38	1,030	1.250
Swan	(4)	6/2.118	1/2.118	21.15	3.523	6.354	2.118	58.00	23.22	81.22	808	1.285
Turkey	(6)	6/1.679	1/1.679	13.28	2.214	5.037	1.679	36.44	14.59	51.03	517	2.045
Cochin	211,300	12/3.371	7/3.371	107.1	62.48	16.86	10.11	296.7	413.8	710.5	9,000	0.2259
Brahma	203,200	16/2.863	19/2.482	103.0	91.92	18.14	12.41	285.4	611.9	897.3	12,600	0.2162
Dorking	190,800	12/3.203	7/3.203	96.68	56.41	16.02	9.609	267.9	373.6	641.5	8,290	0.2502
Dotterel	176,900	12/3.084	7/3.084	89.64	52.29	15.42	9.252	248.3	346.3	594.6	7,710	0.2698
Guinea	159,000	12/2.924	7/2.924	80.57	47.01	14.62	8.772	223.2	311.3	534.5	6,930	0.3002
Leghorn	134,600	12/2.690	7/2.690	68.20	39.78	13.45	8.070	188.9	263.5	452.4	5,890	0.3546
Minorca	110,800	12/2.441	7/2.441	56.14	32.76	12.21	7.323	155.6	216.8	372.4	4,890	0.4307
Petrel	101,800	12/2.339	7/2.339	51.58	30.08	11.70	7.017	142.8	199.2	342	4,490	0.4691
Grouse	80,000	8/2.540	1/4.242	40.54	14.13	9.322	4.242	111.8	93.14	204.9	2,210	0.6360
Thrasher	2,312,000	76/4.430	19/2.068	1,172	63.82	45.78	10.34	3,261	423.8	3,685	25,200	0.02440
Kiwi	2,167,000	72/4.407	7/2.939	1,098	47.49	44.07	8.817	3,058	313.9	3,372	22,200	0.02613
Bluebird	2,156,000	84/4.069	19/2.441	1,092	88.92	44.76	12.21	3,041	589.4	3,630	26,700	0.02594
Chukar	1,780,000	84/3.698	19/2.220	901.9	73.55	40.68	11.10	2,512	487.6	3,000	22,400	0.03140
Falcon	1,590,000	54/4.359	19/2.616	805.7	102.10	39.23	13.08	2,244	677.0	2,921	24,000	0.03464
Lapwing	1,590,000	45/4.775	7/3.183	805.7	55.70	38.19	9.549	2,232	368.5	2,601	18,900	0.03513
Parrot	1,510,500	54/4.247	19/2.548	765.4	96.88	38.22	12.74	2,130	642.3	2,772	22,800	0.03649
Nuthatch	1,510,500	45/4.653	7/3.101	765.4	52.87	37.22	9.303	2,120	349.8	2,470	17,900	0.03700
Plover	1,431,000	54/4.135	19/2.482	725.1	91.82	37.22	12.41	2,019	609.4	2,628	21,600	0.03849
Bobolink	1,431,000	45/4.529	7/3.020	725.1	50.14	36.23	9.060	2,009	331.8	2,341	17,000	0.03905
Martin	1,351,500	54/4.018	19/2.410	684.8	86.68	36.16	12.05	1,906	574.6	2,481	20,400	0.04077
Dipper	1,351,500	45/4.402	7/2.934	684.8	47.33	35.21	8.802	1,898	313.1	2,211	16,100	0.04134
Pheasant	1,272,000	54/3.899	19/2.339	644.5	81.64	35.09	11.70	1,795	541.2	2.336	19,200	0.04329

ACSR/AS

ASTM B549-82 (Contd)... Metric System

ACSR/AS code word	Conductor size CM or AWG	Stranding Nos./mm Alumi-nium	Stranding Nos./mm AS wire	Calculated sectional area mm² Alumi-nium	Calculated sectional area mm² AS wire	Overall diameter mm ACSR AS	Overall diameter mm AS core	Weight kg/mm Alumi-mum	Weight kg/mm AS core	Weight kg/mm ACSR/ AS	Ultimate strength kg	Calculated D.C. resistance at 20°C Ω/km
Bittern	1,272,000	45/4.270	7/2.847	644.5	44.56	34.16	8.541	1,785	294.8	2,080	15,100	0.04393
Skylark	1,272,000	36/4.775	1/4.775	644.5	17.91	33.43	4.775	1,777	118.0	1,895	11,600	0.04431
Grackle	1,192,500	54/3.774	19/2.266	604.2	76.82	33.97	11.33	1,682	508.0	2,190	18,200	0.04620
Bunting	1,192,500	45/4.135	7/2.756	604.2	41.76	33.07	8.268	1,674	276.3	1,950	14,200	0.04685
Finch	1,113,000	54/3.647	19/2.189	564.0	71.50	32.83	10.95	1,571	474.0	2,045	17,000	0.04823
Bluejay	1,113,000	45/3.995	7/2.664	564.0	39.02	31.96	7.992	1,553	258.2	1,821	13,200	0.05019
Curlew	1,033,500	54/3.513	7/3.513	523.7	67.85	31.62	10.54	1,450	448.5	1,899	15,900	0.05302
Ortolan	1,033,500	45/3.848	7/2.565	523.7	36.17	30.78	7.695	1,450	239.3	1.689	12,300	0.05409
Tanager	1,033,500	36/4.303	1/4.303	523.7	14.54	30.12	4.303	1,443	95.83	1,539	9,550	0.05456
Cardinal	954,000	54/3.376	7/3.376	483.4	62.66	30.39	10.13	1,339	414.2	1,753	14,900	0.05741
Rail	954,000	45/3.698	7/2.466	483.4	33.43	29.59	7.398	1,339	221.2	1,560	11,500	0.05857
Catbird	954,000	36/4.135	1/4.135	483.4	13.43	28.95	4.135	1,333	88.50	1,422	8,820	0.05908
Canary	900,000	54/3.279	7/3.279	456.0	59.11	29.51	9.837	1,264	390.7	1,655	13,800	0.06086
Ruddy	900,000	45/3.592	7/2.395	456.0	31.54	28.74	7.185	1,263	208.6	1,472	10,800	0.06208
Mallard	795,000	30/4.135	19/2.482	402.8	91.92	28.95	12.41	1,119	609.4	1,728	16,800	0.06690
Condor	795,000	54/3.081	7/3.081	402.8	52.19	27.73	9.243	1,115	345.0	1,460	12,600	0.06893
Tern	795,000	45/3.376	7/2.250	402.8	27.83	27.01	6.750	1,116	184.1	1,300	9,730	0.07028
Coot	795,000	36/3.774	1/3.774	402.8	11.19	26.42	3.774	1,110	73.72	1,184	7,510	0.07093
Drake	795,000	26/4.442	7/3.454	402.8	65.59	28.13	10.36	1,116	434.0	1,550	13.800	0.06814
Cuckoo	795,000	24/4.623	7/3.081	402.8	52.19	27.73	9.243	1,116	345.3	1,461	12,400	0.06889
Redwing	715,500	30/3.922	19/2.352	362.5	82.56	27.45	11.76	1,007	547.3	1,554	15,100	0.07438
Starling	715,500	26/4.214	7/3.277	362.5	59.04	26.69	9.831	1,005	390.6	1,396	12,400	0.07571
Stilt	715,500	24/4.387	7/2.924	362.5	47.01	26.32	8.772	1,005	311.0	1,316	11,200	0.07650
Gannet	666,600	26/4.067	7/3.162	337.8	54.97	25.75	9.486	935.7	363.7	1,299	11,700	0.08128
Flamingo	666,600	24/4.234	7/2.822	337.8	43.79	25.40	8.466	936.3	289.7	1,226	10,400	0.08213
Swift	636,000	36/3.376	1/3.376	322.3	8.951	23.63	3.376	888.6	58.99	947.6	6,180	0.08863
Egret	636,000	30/3.698	19/2.220	322.3	73.55	25.89	11.10	894.8	487.6	1,382	13,500	0.08365
Scoter	636,000	30/3.698	7/3.698	322.3	75.18	25.89	11.09	894.8	497.9	1,393	13,200	0.08350
Grosbeak	636,000	26/3.973	7/3.089	322.3	52.46	25.15	9.267	893	347.1	1,240	11,200	0.08518
Rook	636,000	24/4.135	7/2.756	322.3	41.76	24.80	8.268	893	276.3	1,169	9.980	0.08623
Kingbird	636,000	16/4.775	1/4.775	322.3	17.91	23.88	4.775	888.6	118.0	1,007	6,810	0.08779
Teal	605,000	30/3.607	19/2.164	306.6	69.88	25.25	10.82	851.4	463.3	1,315	12,900	0.08793
Wood Duck	605,000	30/3.607	7/3.607	306.6	71.54	25.25	10.82	851.4	473.7	1,325	12,870	0.08777
Squab	605,000	26/3.874	7/3.012	306.6	49.88	24.53	9.036	849.1	330.0	1,179	10,690	0.08958
Peacock	605,000	24/4.034	7/2.690	306.6	39.78	24.21	8.070	849.9	263.2	1,113	9,510	0.09047
Eagle	556,500	30/3.459	7/3.459	282.0	65.78	24.21	10.38	783	435.6	1,219	12,180	0.09545
Dove	556,500	26/3.716	7/2.891	282.0	45.95	23.53	8.673	781.1	304.0	1,085	9,840	0.09736
Parakeet	556,500	24/3.868	7/2.578	282.0	36.54	23.20	7.734	781.3	241.8	1,023	8,730	0.09840

Hard-Drawn Copper Stranded Conductor (ASTM B8=64)

Nominal size		Stranding class	Number and diameter of wires /in.	Calculated area	Approx. overall diameter in.	Minimum breaking strength lb.	Calculated resistance at 20°C ohm/1,000 ft.	Standard weight		
MCM	AWG			sq.in.				1b/1,000 ft.	1b/mile	kg/km
1.02	20	B	7/0.0121	0.0008023	0.0363	50.04	10.77	3.154	16.65	4.69
1.62	18	B	7/0.0152	0.001276	0.0456	78.99	6.773	5.015	26.48	7.46
2.58	16	B	7/0.0192	0.002028	0.0576	124.7	4.259	7.974	42.10	11.87
4.11	14	B	7/0.0242	0.003225	0.0726	197.1	2.679	12.68	66.55	18.87
6.53	12	B	7/0.0305	0.005129	0.0915	311.1	1.685	20.16	106.5	30.00
10.38	10	B	7/0.0385	0.008155	0.116	491.7	1.060	32.06	169.3	47.71
13.09	9	B	7/0.0342	0.01028	0.130	618.2	0.8402	40.42	213.3	60.15
16.51	8	B	7/0.486	0.01297	0.146	777.2	0.6663	50.97	269.1	75.85
20.82	7	B	7/0.0545	0.01635	0.164	477.1	0.5284	64.28	339.4	95.66
26.24	6	B	7/0.0612	0.02062	0.184	1,229	0.4191	81.05	427.9	120.6
33.09	5	B	7/0.0688	0.02600	0.206	1,542	0.3223	102.2	539.6	152.1
41.74	4	AA	3/0.1180	0.03278	0.254	1,879	0.261	127.6	673.8	189.9
41.74	4	B & A	7/0.0772	0.03278	0.232	1,938	0.2636	128.9	680.5	191.8
52.62	3	AA	3/0.1325	0.04134	0.286	2,359	0.2070	160.9	849.6	239.5
52.62	3	B & A	7/0.0867	0.04134	0.260	2,433	0.2090	162.5	858.0	241.8
66.36	2	AA	3/0.1487	0.05213	0.320	2,913	0.1641	202.9	1,071	302.0
66.36	2	B & A	7/0.0974	0.05213	0.292	3,045	0.1658	204.9	1,082	304.9
83.69	1	AA	3/0.1670	0.06573	0.360	3,621	0.1302	255.9	1,351	380.8
83.69	1	A	7/0.1093	0.06573	0.328	3,804	0.1314	258.4	1,364	384.6
83.69	1	B	19/0.0664	0.06573	0.332	3,899	0.1314	258.4	1,364	384.6
105.6	1/0	A & AA	7/0.1228	0.08289	0.368	4,752	0.1042	325.8	1,720	484.9
105.6	1/0	B	19/0.0745	0.08289	0.372	4.901	0.1042	325.8	1,720	484.9
133.1	2/0	A & AA	7/0.1379	0.1045	0.414	5,926	0.08267	410.9	2,169	611.5
133.1	2/0	B	19/0.0837	0.1045	0.419	6,152	0.08267	410.9	2,169	611.5
167.8	3/0	A & AA	7/0.1548	0.1318	0.464	7,366	0.06556	518.1	2,736	771.0
167.8	3/0	B	19/0.0940	0.1318	0.470	7,698	0.06556	518.1	2,736	771.0
211.6	4/0	A & AA	7/0.1737	0.1662	0.522	9,154	0.05199	653.3	3,450	972.2
211.6	4/0	B	19/0.1055	0.1662	0.528	9,617	0.05119	653.3	3,450	972.2
250		AA	12/0.1443	0.1963	0.600	11,130	0.04400	771.9	4,076	1,149
250		A	19/0.1147	0.1963	0.574	11,360	0.04400	771.9	4,076	1,149
250		B	37/0.0822	0.1963	0.575	11,560	0.04400	771.9	4,076	1,149
300		AA	12/0.1581	0.2356	0.657	13,170	0.03667	926.3	4,891	1,379
300		A	19/0.1257	0.2356	0.628	13,510	0.03667	926.3	4,891	1,379
300		B	37/0.0900	0.2356	0.630	13,870	0.03667	926.3	4,891	1,379
350		AA	12/0.1708	0.2749	0.710	15,140	0.03143	1,081	5,706	1,609

ACSR/AS

Australian Standard 1220 Part 3 - 1973

ACSR/AS code word	Conductor size	Standing Nos./mm		Calculated sectional area mm²		Overall diameter mm		Wight kg/km			Ultimate strengh	Calculated D.C. resistance
		Alumi-num	AS wire	Alumi-num	ACSR/AS	ACSR/AS	AS core	Alumi-num	AS wire	ACSR/AS	KN	at20°C Ω/km
	mm2											
Skating	7	3/1.75	4/1.75	7.215	16.84	5.25	–	19.60	63.85	83.5	12.3	2.73
Soccer	15	3/2.50	4/2.50	14.73	34.36	7.50	–	40.11	129.7	170	24.9	1.34
Swimming	28	4/3.00	3/3.00	28.28	49.48	9.00	–	76.80	140.3	217	28.8	0.804
Tennis	44	4/3.75	3/3.75	44.16	77.31	11.25	–	120.2	219.1	339	42.8	0.514
Angling	29	6/2.50	1/2.50	29.45	34.36	7.50	2.50	81.0	32.3	113	10.7	0.923
Archery	42	6/3.00	1/3.00	42.41	49.48	9.00	3.00	116.3	46.6	163	15.0	0.641
Baseball	66	6/3.75	1/3.75	66.24	77.31	11.25	3.75	182.1	72.8	255	22.4	0.410
Bowls	106	6/4.75	7/1.60	106.32	120.40	14.3	4.80	291.8	93.5	385	32.6	0.259
Cricket	147	30/2.50	7/2.50	147.27	181.60	17.5	7.5	407.9	227.1	635	64.6	0.182
Darts	212	30/3.00	7/3.00	212.07	261.50	21.0	9.0	585.8	327.7	913	91.3	0.126
Diving	289	30/3.50	7/3.50	228.63	356.0	24.5	10.5	797.4	445.8	1,243	121	0.0928
Golf	382	54/3.00	7/3.00	381.73	431.2	27.0	9.0	1,055	327.7	1,383	119	0.0726
Gymnastics	448	54/3.25	7/3.25	447.98	506.0	29.30	9.75	1,237	384.7	1,622	138	0.0619
Hurdles	520	54/3.50	7/3.50	519.53	586.9	31.5	10.5	1,436	445.8	1,882	159	0.0533
Lacrosse	596	54/3.75	19/2.25	596.16	671.7	33.8	11.25	1,651	501.7	2,153	181	0.0465
Rugby	957	54/4.75	19/2.85	956.88	1,085	42.8	14.25	2,646	850.3	3,496	295	0.0290

Standard Specification of Japan Federation of Electric Power Companies A241-1977

Group	Conductor size	Standing Nos./mm		Calculated sectional area mm²		Overall diameter mm		Weight kg/km			Ultimate strengh	Calculated D.C. resistance
		Alumi-nium	AS wire	Alumi-num	ACSR/AS wire	ACSR/AS	AS core	Alumi-nium	AS wire	ACSR/AS	Kg	at20°C Ω/km
	mm²											
A	*810	45/4.8	7/3.2	814.5	56.29	38.4	9.6	2,259	355	2.61	18.480	0.0347
	610	54/3.8	7/3.8	612.4	69.38	34.2	11.4	1,698	509	2,207	18.350	0.0451
	410	26/4.5	7/3.5	413.4	67.35	28.5	10.5	1,145	433	1,578	13.910	0.0661
	330	26/4.0	7/3.1	326.8	52.84	25.3	9.3	905.4	333.6	1,239	10.950	0.0836
	240	30/3.2	7/3.2	241.3	56.29	22.4	9.6	668.9	355.1	1,024	10.210	0.110
	*200	30/2.9	7/2.9	198.2	46.24	20.3	8.7	549.3	294.6	843.9	8.640	0.136
	160	30/2.6	7/2.6	159.3	37.16	18.2	7.8	441.5	234.9	676.4	6.980	0.169
	120	30/2.3	7/2.3	124.7	29.09	16.1	6.9	345.7	187.1	532.8	5.540	0.216
	*95	6/4.5	1/4.5	95.40	15.90	13.5	4.5	261.2	100.8	362.0	3.180	0.283
	*58	6/3.5	1/3.5	57.73	9.621	10.5	3.5	158.1	61.55	219.7	1.980	0.467
	*32	6/2.6	1/2.6	31.85	5.309	7.8	2.6	87.19	33.39	120.6	1.140	0.851
	*25	6/2.3	1/2.3	24.93	4.155	6.9	2.3	68.26	26.60	94.9	906	1.09
	*100	5/2.9	4/2.9	99.08	26.42	14.5	–	272.8	168.4	441.2	4.720	0.267
	*80	15/2.6	4/2.6	79.64	21.24	13.0	–	219.2	134.2	353.4	3.810	0.332
B	*810	45/4.8	7/3.2	814.5	56.29	38.4	9.6	2.259	373	2.632	18.800	0.0348
	610	54/3.8	7/3.8	612.2	79.38	34.2	11.4	1,698	526	2.224	18.220	0.0454
	410	26/4.5	7/3.5	413.4	67.35	28.5	10.5	1,145	446	1,591	14.040	0.0665
	330	26/4.0	7/3.1	326.8	52.84	25.3	9.3	905.4	349.9	1.255	11.260	0.0842
	240	30/3.2	7/3.2	241.3	56.29	22.4	9.6	668.9	372.9	1,042	10.520	0.111
	*200	30/2.9	7/2.9	198.2	46.24	20.3	8.7	549.3	306.2	855.5	8.730	0.136
	160	30/2.6	7/2.6	159.3	37.16	18.2	7.8	441.5	246.2	687.7	7.050	0.169
	120	30/2.3	7/2.3	124.7	29.09	16.1	6.9	345.7	192.6	538.3	559.0	0.216
	*95	6/4.5	1/4.5	95.40	15.90	13.5	4.5	261.2	104.8	366.0	3.070	0.285
	*58	6/3.5	1/3.5	57.73	9.621	10.5	3.5	158.1	63.40	221.5	2.000	0.471
	*100	15/2.9	4/2.9	99.08	26.42	14.5	–	272.8	175.0	447.8	4.770	0.267
	*80	15/2.6	4/2.6	79.64	21.24	13.0	–	219.2	140.7	359.9	3.850	0.332

DIN Size ACSR/AS : 48200 Teil 8 - 1977/48204 - 1974

Conductor size mm²		Ratio of	Stranding Nos./mm		Calculated Sectional area mm²		Overall diameter mm		Weight kg/km			Ultimate strength	Calculated D.C. resistance
Nominal	Calculated Total	Al/St	Alumi-nium	AS	Alumi-nium	ACSR/ AS	ACSR/ AS	AS	ACSR/ AS	Alumi-num	AS	N	at 20°C ohm/km
16/25	17.85	6	6/1.8	1/1.8	15.3	17.9	5.4	–	58.6	41.8	16.8	5,950	1.779
25/4	27.8	6	6/2.25	1/2.25	23.8	27.8	6.8	–	91.6	65.4	26.2	9,200	1.139
35/6	40	6	6/2.7	1/2.7	34.3	40.0	8.1	–	131.9	94.2	37.7	12,950	0.7906
44/32	75.7	1.4	14/2	7/2.4	44	75.7	11.2	7.2	331.0	121.4	209.6	47,050	0.5282
50/8	56.3	6	6/3.2	1/3.2	48.3	56.3	9.6	–	185.2	132.2	53.0	17,900	0.5629
50/30	81	1.7	12/2.33	7/2.33	51.2	81.0	11.7	6.99	338.7	141.1	197.6	45,750	0.4712
70/12	81.3	6	26/1.85	7/1.44	69.9	81.3	11.7	4.32	268.3	192.8	75.5	26,900	0.3915
95/15	109.7	6	26/2.15	7/1.67	94.4	109.7	13.6	5.01	361.8	260.3	101.5	35,900	0.2899
95/55	152.8	1.7	12/3.2	7/3.2	96.5	152.8	16	9.6	638.9	266.2	372.7	85,200	0.2498
105/75	181.5	1.4	14/3.1	19/2.25	105.7	181.5	17.5	11.25	794.1	291.8	502.3	110,400	0.2203
120/20	141.4	6	26/2.44	7/1.9	121.6	141.4	15.5	5.7	466.9	335.5	131.4	45,850	0.2250
120/70	193.3	1.7	12/3.6	7/3.6	122	193.3	18	10.8	808.7	337	471.7	99,550	0.1974
125/30	157.7	4.3	30/2.33	7/2.33	127.9	157.7	16.1	6.99	550.6	353	197.6	59,300	0.2093
150/25	173.1	6	26/2.7	7/2.1	148.9	173.1	17.1	6.31	571.1	410.6	160.5	55,500	0.1838
170/40	211.9	4.3	30/2.7	7/2.7	171.8	211.9	18.9	8.1	739.5	474.2	265.3	78,950	0.1559
185/30	213.6	6	26/3	7/2.33	183.8	213.6	19	6.99	704.6	507	197.6	67,700	0.1489
210/35	243.2	6	26/3.2	7/2.49	209.1	243.2	20.3	7.47	802.3	576.6	225.7	76,550	0.1308
210/50	261.6	4.3	30/3	7/3	212.1	261.6	21	9	913.1	585.5	327.6	96,650	0.1263
230/30	260.7	7.7	24/3.5	7/2.33	230.9	260.7	21	6.99	834.1	636.5	197.6	74,550	0.1197
240/40	282.5	6	26/3.45	7/2.68	243	282.5	21.9	8.04	931.8	670.4	261.4	88,400	0.1126
265/35	297.8	7.7	24/3.74	7/2.49	263.7	297.8	22.4	7.47	952.5	726.9	225.6	84,600	0.1048
300/50	353.7	6	26/3.86	7/3	304.3	353.7	24.5	9	1,167	839	327.6	109,500	0.0899
305/40	344.1	7.7	54/2.68	7/2.68	304.6	344.1	24.1	8.04	1,103	841.2	261.4	101,150	0.0909
340/30	369.1	11.3	48/3	7/2.33	339.3	369.1	25	6.99	1,134	936.8	197.6	93,950	0.0827
380/50	431.5	7.7	54/3	7/3	382	431.5	27	9	1,382	1,054.3	327.6	125,250	0.0725
385/35	420.1	11.3	48/3.2	7/2.49	386	420.1	26.7	7.47	1,291	1,065.4	225.6	105,900	0.0727
435/55	490.6	7.7	54/3.2	7/3.2	434.3	490.6	28.8	9.6	1,572	1,199.0	372.6	141,200	0.0638
450/40	488.2	11.3	48/3.45	7/2.68	448.7	488.2	28.7	8.04	1,500	1,238.6	261.4	122,050	0.0625
490/65	553.9	7.7	54/3.4	7/3.4	490.3	553.9	30.6	10.2	1,774	1,353.7	420.7	154,050	0.0565
495/35	528.2	14.5	45/3.74	7/2.49	494.1	528.2	29.9	7.47	1,594	1,368.2	225.6	121,900	0.0571
510/45	555.5	11.3	48/3.68	7/2.87	510.2	555.5	30.7	8.61	1,708	1,408.1	299.8	138,300	0.0549
550/70	621.3	7.7	54/3.6	7/3.6	550	621.3	32.4	10.6	1,990	1,518.3	471.7	168,750	0.0504
560/50	611.2	11.3	48/3.86	7/3	561.7	611.2	32.2	9	1,878	1,550.2	327.6	150,600	0.0500
570/40	610.7	14.5	45/4.02	7/2.68	571.2	610.7	32.2	8.04	1,823	1,561.7	261.4	139,850	0.0494
650/45	698.8	14.5	45/4.3	7/2.87	653.5	698.8	34	8.61	2,106	1,805.9	299.8	159,550	0.0432
680/85	764.6	7.7	54/4	19/2.4	678.6	764.6	36	12	2,445	1,874.5	570.9	214,150	0.0409
1,045/45	1,090.9	23.1	72/4.3	7/2.87	1,045.6	1,090.9	43	8.61	3,207	2,907.1	299.8	221,850	0.0274

COPPER CONDUCTORS

ERI-TECH

Individual copper wires are drawn to size and used as supply in wire condition to the customer. They are available also in bare strands of copper conductors and also insulated cables.

Very fine wires of copper can be produced at speciality machines at Eritech.

Single wire Diameter in mm	Standard reels
0.04 to 0.50	25 to 250 kg
0.50 to 1.20	80 to 1000 kg
1.20 to 4.00	250 to 1000 kg

Stranded wires are produced as bare conductors in various configurations as prescribed later in this chapter. Sizes can be produced also as per the customer requests.

Eritech owns the finest wire drawing machine and the facilities to produce fine wires upto 0.04 mm dia. These wires can be supplied conforming to specification as :

BS-125 - Hard drawn copper wire
BS-174 - H.D. copper for Telecom
BS-128 - Annealed copper wire
ASTM - 245 - Tinned H.D. copper wire

These wires are also supplied in equivalent DIN or ASTM standard.

Other speciality non ferrous or ferrous fine wires can be supplied on request.

600/1000 V Stranded Copper Conductors

Nominal area of cond uctor	Number and nominal diameter of wires in circular conductor	Thickness of insulation	Thickness of sheath	Approx overall diameter
mm²	mm	mm	mm	mm
50	19/1.78	1.4	1.4	15.1
70	19/2.14	1.4	1.4	16.9
95	19/2.52	1.6	1.5	19.4
120	37/2.03	1.6	1.5	21.0
150	37/2.25	1.8	1.6	23.2
185	37/2.52	2.0	1.7	25.8
240	61/2.25	2.2	1.8	29.0
300	61/2.52	2.4	1.9	32.1
400	61/2.85	2.6	2.0	35.8
500	61/3.20	2.8	2.1	39.6
630	127/2.52	2.8	2.2	43.8
800	127/2.85	2.8	2.3	48.3
1000	127/3.20	3.0	2.5	53.7

EARTHWIRE/STAY WIRE

BS : 183 Specn

Construction Number of wires/ wire diameter	Approximate strand diameter	Minimum breaking load of strand							Approx. weight
		Grade 350	Grade 480	Grade 700	Grade 850	Grade 1000	Grade 1150	Grade 1300	
	mm	kN	kN	kN	kN	kN	kN	kN	kg/km
3/1.80	3.9	2.65	3.66	–	–	–	–	–	60
3/2.65	5.7	5.80	7.95	–	–	–	–	–	130
3/3.25	7.0	8.70	11.95	–	–	–	–	–	195
3/4.00	8.6	13.20	18.10	–	–	–	–	–	295
4/1.80	4.4	3.55	4.90	–	–	–	–	–	80
4/2.65	6.4	7.70	10.60	–	–	–	–	–	172
4/3.25	7.9	11.60	15.90	–	–	–	–	–	260
4/4.00	9.7	17.60	24.10	35.20	–	–	–	–	390
5/1.50	4.1	3.10	4.24	6.18	–	–	–	–	69
5/1.80	4.9	4.45	6.10	8.90	–	–	–	–	95
5/2.65	7.2	9.65	13.25	19.30	–	–	–	–	220
5/3.25	8.8	14.50	19.90	29.00	–	–	–	–	320
5/4.00	10.8	22.00	30.15	43.95	–	–	–	–	490
7/0.56	1.7	0.60	0.83	1.20	–	1.70	1.98	2.24	14
7/0.71	2.1	0.97	1.33	1.94	–	2.75	3.19	3.60	28
7/0.85	2.6	1.39	1.90	2.80	–	3.95	4.57	5.15	31
7/0.90	2.7	1.55	2.14	3.1	–	4.45	5.12	5.80	35
7/1.00	3.0	1.92	2.64	3.85	–	5.50	6.32	7.15	43
7/1.25	3.8	3.01	4.10	6.00	–	8.55	9.88	11.15	67
7/1.40	4.2	3.75	5.17	7.54	9.16	10.75	12.35	14.00	84
7/RS + +	4.3	3.85	5.28	7.70	9.35	11.00	12.65	14.30	86
7/1.60	4.8	4.90	6.75	9.85	11.95	14.10	16.20	18.30	110
7/1.80	5.4	6.23	8.55	12.45	–	17.80	20.50	23.20	140
7/2.00	6.0	7.70	10.55	15.40	–	22.00	25.30	28.60	170
7/2.36	7.1	10.70	14.70	21.40	–	30.60	35.20	39.80	240
7/2.65	8.0	13.50	18.50	27.00	–	38.60	44.40	50.20	300
7/3.00	9.0	17.30	23.75	34.65	–	49.50	56.90	64.30	392
7/3.15	9.5	19.10	26.20	38.20	–	54.55	62.75	70.90	430
7/3.25	9.8	20.30	27.85	40.65	–	58.05	66.80	75.50	460
7/3.65	11.0	25.60	35.15	51.25	–	73.25	84.20	95.20	570
7/4.00	12.0	30.90	42.20	61.60	–	88.00	101.0	114.00	690
7/4.25	12.8	34.75	47.65	69.50	–	99.30	114.0	129.00	780
7/4.75	14.0	43.40	59.45	86.80	–	124.0	142.7	161.3	970
19/1.00	5.0	5.22	7.16	10.45	–	14.92	17.16	19.40	120
19/1.25	6.3	8.16	11.19	16.32	–	23.32	26.81	30.31	180
19/1.40	7.0	10.24	14.04	20.47	–	29.25	33.64	38.02	230
19/1.60	8.0	13.37	18.34	26.75	–	38.20	43.93	49.66	300
19/2.00	10.0	20.90	28.65	41.78	50.74	59.69	68.64	77.60	470
19/2.50	12.5	32.65	44.80	65.29	79.28	93.27	107.3	121.3	730
19/3.00	15.0	47.00	64.50	94.00	114.1	134.3	154.5	174.6	1050
19/3.55	17.8	65.80	90.27	131.6	159.9	188.0	216.3	244.5	1470
19/4.00	20.0	83.55	114.6	167.1	203.0	238.7	274.6	310.4	1870
19/4.75	23.8	117.85	161.6	235.7	286.0	336.7	387.2	437.7	2630

Hard-Drawn Copper Stranded Conductor (ASTM B8=64)

Nominal size		Stranding class	Number and diameter of wires /in.	Calculated area	Approx. overall diameter	Minimum breaking strength	Calculated resistance at 20°C	Standard weight		
MCM	AWG			sq.in.	in.	lb.	ohm/1,000 ft.	1b/1,000 ft.	1b/mile	kg/km
350		A	19/0.1357	0.2749	0.678	15,590	0.03143	1,081	5,706	1,609
350		B	37/0.0973	0.2749	0.631	16,060	0.03143	1,081	5,706	1,609
400		A & AA	19/0.1451	0.3142	0.726	17,810	0.02750	1,235	6,521	1,838
400		B	37/0.1040	0.3142	0.728	18,320	0.02750	1,235	6,521	1,838
450		AA	19/0.1539	0.3534	0.770	19,750	0.02445	1,389	7,334	2,067
450		B & A	37/0.1103	0.3534	0.772	20,450	0.02445	1,389	7,334	2,067
500		AA	19/0.1622	0.3927	0.811	21,950	0.02200	1,544	8,151	2,298
500		B & A	37/0.1162	0.3927	0.813	22,510	0.02200	1,544	8,151	2,298
550		A & AA	37/0.1219	0.4320	0.853	24,760	0.02000	1,689	8,966	2,508
550		B	61/0.0950	0.4320	0.855	25,230	0.02000	1,689	8,966	2,508
600		A & AA	37/0.1237	0.4712	0.891	27,020	0.01834	1,853	9,781	2,758
600		B	61/0.0992	0.4712	0.893	27,530	0.01834	1,853	9,781	2,758
650		AA	37/0.1325	0.5105	0.928	29,130	0.01692	2,007	10,600	2,987
650		B & A	61/0.1032	0.5105	0.929	29,770	0.01692	2,007	10,600	2,987
700		AA	37/0.1375	0.5498	0.962	31,170	0.01572	2,161	11,410	3,216
700		B & A	61/0.1071	0.5498	0.964	31,820	0.01572	2,161	11,410	3,216
750		AA	37/0.1424	0.5890	0.997	44,400	0.01467	2,316	12,230	3,447
750		B & A	61/0.1109	0.5890	0.998	34,090	0.01467	2,316	12,230	3,447
800		AA	37/0.1470	0.6283	1.029	35,120	0.01375	2,470	13,040	3,676
800		B & A	61/0.1145	0.6283	1.031	36,360	0.01375	2,470	13,040	3,676
900		AA	37/0.1560	0.7069	1.092	39,510	0.01222	2,779	14,670	4,136
900		B & A	61/0.1215	0.7069	1.094	40,520	0.01222	2,779	14,670	4,136
1,000		AA	37/0.1644	0.7854	1.151	43,830	0.01100	3,088	16,300	4,596
1,000		B & A	61/0.1280	0.7854	1.152	45,030	0.01100	3,088	16,300	4,596
1,250		A	61/0.1431	0.9817	1.288	55,670	0.008801	3,859	20,380	5,743
1,250		B	91/0.1172	0.9817	1.289	56,280	0.008801	3,859	20,380	5,743
1,500		A	61/0.1568	1.178	1.411	65,840	0.007334	4,631	24,450	6,892
1,500		B	91/0.1284	1.178	1.412	67,540	0.007334	4,631	24,450	6,892
1,750		A	91/0.1387	1.374	1.526	77,930	0.006286	5,403	28,530	8,041
1,750		B	127/0.1174	1.374	1.526	78,800	0.006286	5,403	28,530	8,041
2,000		A	91/0.1482	1.571	1.630	87,790	0.005501	6,175	32,600	9,190
2,000		B	127/0.1255	1.571	1.632	90,050	0.005501	6,175	32,600	9,190
2,500		A	91/0.1657	1.963	1.823	109,600	0.004444	7,794	41,150	11,600
2,500		B	127/0.1403	1.963	1.824	111,300	0.004444	7,794	41,150	11,600
3,000		A	127/0.1537	2.356	1.998	131,700	0.003703	9,353	49,390	13,920
3,500		A	127/0.1660	2.749	2.158	153,400	0.003205	11,020	58,180	16,400

Hard-Drawn Copper Stranded Conductor (BS 125 : 1954)

Nominal area Sq.in.	Number and diameter of wires in.	Approx. overall diameter in.	Resistance at 200C ohm/1,000 yds		Approx. breaking strength lb	Weight per 1,000 yds lb	
			Standard	Maximum		Standard	Minimum
0.022	7/0.0.64	0.192	1.126	1.137	1.370	262.2	257.3
0.025	3/0.104	0.224	0.9942	1.004	1.520	297.0	291.1
0.050	3/0.147	0.317	0.4973	0.5023	2.920	593.3	581.4
0.058	7/0.104	0.312	0.4261	0.4304	3.540	693.2	679.3
0.075	7/0.116	0.348	0.3424	0.3459	4.350	862.5	844.8
0.100	7/0.156	0.408	0.249	0.2515	5.870	1.186	1.162
0.150	7/0.166	0.498	0.167	0.1686	8.530	1.766	1.731
0.200	7/0.193	0.579	0.1235	0.1247	11.300	2.388	2.340
0.200	19/0.116	0.580	0.1267	0.1280	11.600	2.351	2.304
0.250	7/0.215	0.645	0.09948	0.1005	13.800	2.963	2.904
0.250	19/0.131	0.655	0.09931	0.1003	14.600	2.998	2.93

Hard-Drawn Copper Stranded Conductor - DIN 48201

Nominal size mm2	Number and diameter of wires /mm	Calculated area mm2	Approx. overall diameter mm	Calculated breaking strength kg	Calculated resistance at 20°C ohm/km	Standard weight kg/km
10	7/1.35	10.0	4.1	399	7.786	90.1
16	7/1.7	15.9	5.1	637	1.123	143
25	7/2.1	24.2	6.3	973	0.738	218
35	7/2.5	34.4	7.5	1.372	0.525	309
50	7/3.0	49.5	9.0	1.981	0.264	445
50	19/1.8	48.3	9.0	1.938	0.372	436
70	19/2.1	65.8	10.5	2.641	0.271	594
95	19/2.5	93.2	12.5	3.724	0.192	842
120	19/2.8	117	14.0	4.674	0.153	1,056
150	37/2.25	147	15.8	5.883	0.122	1,335
185	37/2.5	182	17.5	7.252	0.098	1,649
240	61/2.25	243	20.3	9.699	0.074	2,206
300	61/2.5	299	22.5	11.956	0.060	2,723

EARTHWIRE/STAY WIRE

Galvanised steel wire in mild steel, medium carbon and high carbon steel are available with Eritech as individual wires & also in stranded forms. Individual wires are supplied in each coil weighing 70 to 135 kg or as prescribed by the customer.

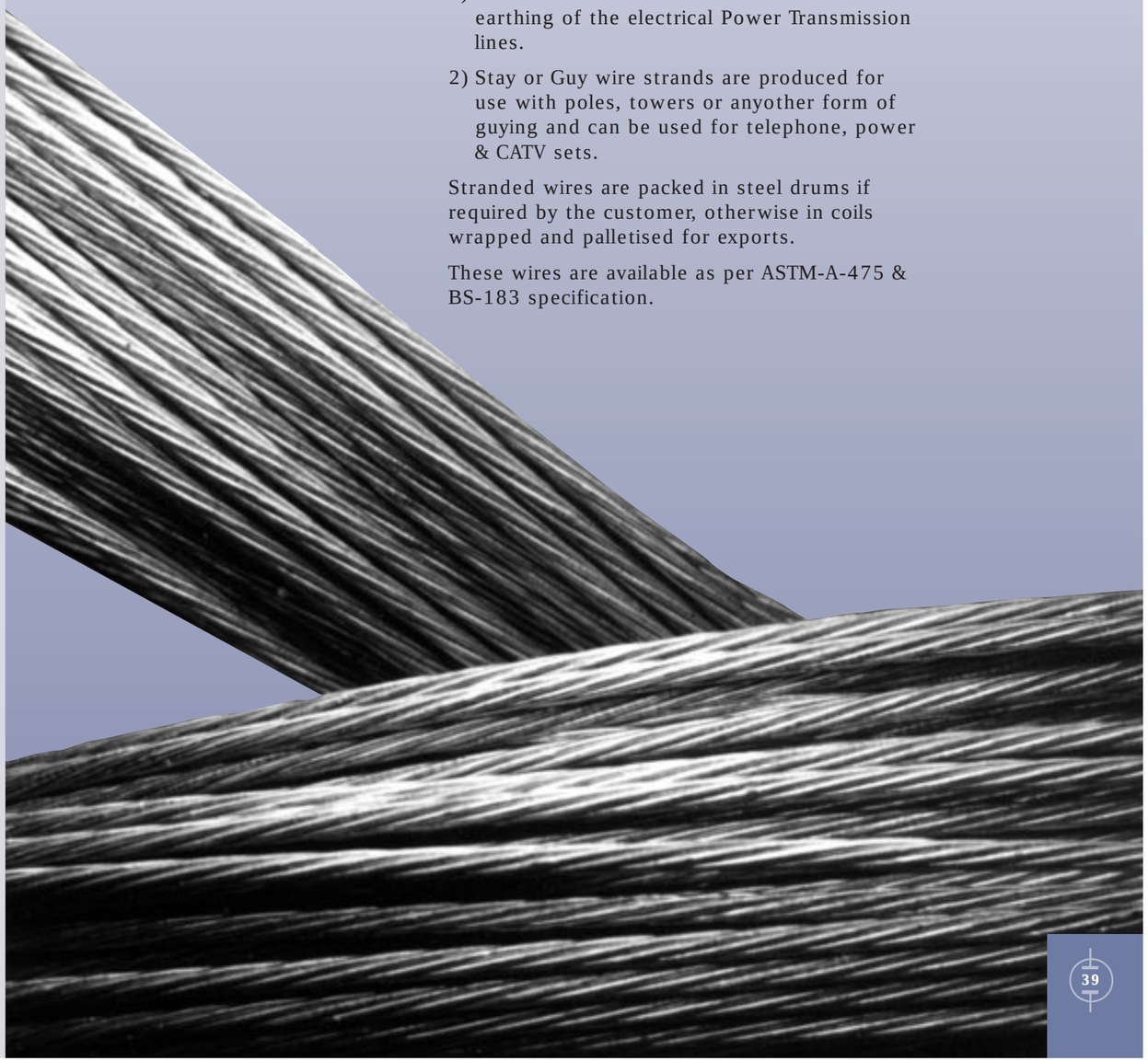
Stranded wire are produced as -

1) Overhead Groundwire or static wire for earthing of the electrical Power Transmission lines.

2) Stay or Guy wire strands are produced for use with poles, towers or anyother form of guying and can be used for telephone, power & CATV sets.

Stranded wires are packed in steel drums if required by the customer, otherwise in coils wrapped and palletised for exports.

These wires are available as per ASTM-A-475 & BS-183 specification.



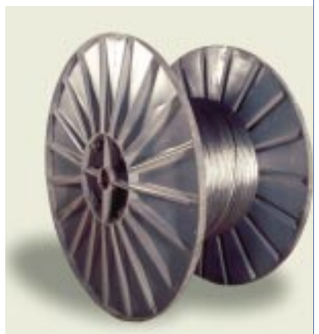
STEEL DRUM

Eritech manufactures its own Steel Drums to meet the demands of the industry in addition to its own captive requirements. These Steel drums are suitably reinforced for seaworthy transportation and multi-handling purpose. Drums are painted with multiple coats of anticorrosive paints and carry markings on them as desired by the customer.

Steel Drums give special advantages, being –

- Lighter in weight
- Unbreakable
- Reusable
- Non contaminating as in wood
- Environmentally friendly

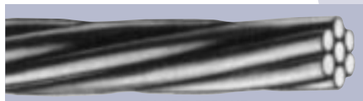
Drums are made in various sizes with container-friendly configurations.



Flange Diameter	Barrel Diameter	Traverse	Bore Diameter	Flange Thickness
mm	mm	mm	mm	mm
1150	560	660	100	40
1200	560	660	100	40
1450	475	660	100	40
1965	560	650	100	50

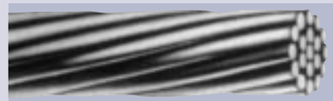
EARTHWIRE/STAY WIRE

ASTM : A-475 SPECN

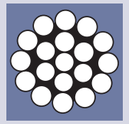


7 WIRE STRAND

GUY, MESSENGER STRAND & WIRE



19 WIRE STRAND



19 WIRE GLAVANIZED STEEL STRAND

Construction Number of wires/ wire diameter	Approximate strand diameter		Siemens Martin Grade	High Strength Grade	Extra-High Strength Grade	Approx. weight
	(inch)	(mm)	kN	kN	kN	Kg/Km
3/2.64	7/32	5.56	10.409	15.569	21.796	131
3/3.05	1/4	6.35	13.523	21.040	29.981	174
3/3.05	1/4	6.35	-	-	-	174
3/3.30	9/32	7.14	15.035	23.398	33.362	204
3/3.68	5/16	7.94	18.193	28.246	40.479	256
3/4.19	3/8	9.52	24.732	37.187	52.489	328
7/1.04	1/8	3.18	4.048	5.916	8.140	49
7/1.32	5/32	3.97	6.539	9.519	13.078	76
7/1.57	3/16	4.76	8.452	12.677	17.748	108
7/1.65	3/16	4.76				118
7/1.83	7/32	5.56	11.387	17.126	24.020	145
7/2.03	1/4	6.35	14.012	21.129	29.581	181
7/2.36	9/32	7.14	18.905	28.469	39.812	243
7/2.64	5/16	7.94	23.798	35.586	49.820	305
7/2.77	5/16	7.94	-	-	-	335
7/3.05	3/8	9.52	30.915	48.040	68.503	407
7/3.68	7/16	11.11	41.591	64.499	92.523	594
7/4.19	1/2	12.70	53.823	83.627	119.657	768
7/4.78	9/16	14.29	69.837	108.981	155.688	991
7/5.26	5/8	15.88	84.961	131.667	188.605	1211
19/2.54	1/2	12.70	56.492	84.961	118.768	751
19/2.87	9/16	12.49	71.616	107.202	149.905	948
19/3.18	5/8	15.88	80.513	124.995	178.819	1184
19/3.81	3/4	19.05	116.543	181.487	259.331	1719
19/4.50	7/8	22.22	159.691	248.211	354.523	2352
19/5.08	1	25.40	209.066	325.610	464.839	2384
37/3.63	1	25.40	205.508	319.827	456.832	3061
37/4.09	11/8	28.58	262.000	407.457	581.827	4006
37/4.55	11/4	31.75	324.720	505.318	721.502	4833

COVERED COPPER CONDUCTORS

					Current Rating	
Nominal cross sectional area of conductor	No. and nominal diameter of wires	Nominal thickness of insulation	Approx. overall diameter	Approx. Weight	Bunched and enclosed in conduit two cables Single phase at 35°C	Clipped to a surface or on a cable tray bunched & unenclosed two cables single phase at 35°C
mm^2	mm	mm	mm	Kg/Km	Amp	Amp
1.0re	1/1.13	0.7	2.8	17	13	16
1.5 re	1/1.38	0.7	3.3	22	16	20
1.5 rm	7/0.50	0.7	3.5	23	16	20
2.5 re	1/1.78	.08	3.9	35	22	28
2.5 rm	7/0.67	0.8	4.2	35	22	28
4.0 rm	7/0.85	0.8	4.8	55	30	37
6.0 rm	7/1.04	0.8	5.4	75	38	47
10 rm	7/1.35	1.0	6.8	115	52	63
16 rm	7/1.70	1.0	8.0	178	70	85
16 rm	19/1.04	1.0	8.1	180	70	85
25 rm	7/2.14	1.2	9.8	280	91	110
25 rm	19/1.30	1.2	9.9	280	91	110
35 rm	19/1.53	1.2	11.0	390	112	136
50 rm	19/1.78	1.4	13.0	525	136	164
70 rm	19/2.14	1.4	15.0	720	173	207
95 rm	19/2.52	1.6	17.0	1005	216	253
120 rm	37/2.03	1.6	19.0	1227	244	291
150 rm	37/2.25	1.8	21.0	1535	-	333
185 rm	37/2.52	2.0	23.5	1891	-	381
240 rm	61/2.25	2.2	26.5	2458	-	452
300 rm	61/2.52	2.4	29.5	3055	-	526
400 rm	61/2.85	2.6	33.5	4078	-	639
500 rm	61/3.20	2.8	37.0	5048	-	752

COVERED ALUMINIUM CONDUCTORS

PVC-COVERED STRANDED ALL ALUMINIUM CONDUCTOR (AAC)
(Weather resistant Line Wire)

Nominal aluminium area	Stranding and wire diameter	Approximate overall diameter of bare conductor	Calculated resistance per km at 20°C	Approximate breaking load	Approximate overall diameter of covered conductor	Approximate mass per km of covered conductor
					Type 8	Type 8
mm2	mm	mm	Ohm	KN	mm	kg
22	7/2.06	6.18	1.227	3.99	8.2	100
50	7.3.10	9.30	0.5419	8.28	11.7	200
100	7/4.39	13.17	0.2702	16.00	16.0	360
200	19/3.78	18.90	0.1349	32.40	21.7	690

PVC-COVERED ALUMINIUM CONDUCTORS, STEEL REINFORCED (ACSR)
(Weather-resistant Line Wire)

Nominal Aluminium area	Stranding and Wire diameter		Approximate over all diameter of bare conductor	Calculated resistance per km at 20°C	Approximate breaking load	Approximate overall diameter of covered conductor	Approximate mass per km of covered conductor
	Aluminium	Steel				Type 16	Type 16
mm^2	mm	mm	mm	Ohm	KN	mm	Kg
25	6/2.36	1/2.36	7.08	1.093	0.61	10.7	190
50	6/3.35	1/3.35	10.05	0.5426	18.35	14.1	330
100	6/4.72	7/1.57	14.15	0.2733	32.70	18.2	550
150	30/2.59	7/2.59	18.13	0.1828	69.20	22.2	920
150	18/3.25	1/3.35	16.75	0.1815	35.70	20.8	680
175	18/2.79	7/2.79	19.53	0.1576	79.80	23.6	1050
175	18/3.61	1/3.61	18.05	0.1563	41.10	22.1	780
200	30/3.00	7/3.00	21.00	0.1363	92.25	25.0	1190
200	18/3.86	1/3.86	19.30	0.1367	46.55	23.3	870

PVC-COVERED ALUMINIUM ALLOY STRANDED CONDUCTORS (AAAC)

Nominal aluminium area	Stranding and wire diameter	Approximate overall diameter bare conductor	Calculated resistance of per km at 20°C	Approximate breaking load	Approximate overall diameter of covered conductor	Approximate mass per km of covered conductor
					Type 16	Type 16
mm^2	mm	mm	Ohm	KN	mm	Kg
25	7/2.34	7.02	1.094	8.44	10.6	170
50	7/3.30	9.90	0.5498	16.80	13.9	280
100	7/4.65	13.95	0.2769	33.30	18.0	470
150	19/3.48	17.40	0.1830	50.65	21.4	680
175	19/3.76	18.80	0.1568	59.10	22.8	780

CONVERSION TABLES

English and metric weights and measures

MULTIPLY	BY	TO OBTAIN
WEIGHT-English		
Ounces	28.3495	grams
Pounds (Av.)	453.59	grams
Pounds(Av.)	.45359	kilograms
Tons (short)	907.19	kilograms
Tons (long)	1016.05	kilograms
WEIGHT - Metric		
Grams	.03527	ounces
Grans	.002205	pounds
kilograms	35.274	ounces
kilograms	2.2046	pounds
kilograms	.001102	tons(short)
kilograms	.0009842	tons(long)
MISCELLANEOUS		
English		
Pounds per 1000 feet	1.48816	kilograms per kilometer
Pounds per mile	.28185	kilograms per kilometer
Pounds per square inch	.0007031	kilograms per sq. millimeter
Pounds per square inch	.07031	kiograms per sq. centimeter
Pounds per cunic inch	27.68	grams per cubi centimeter
Feet per second	18.288	meters per mnute
Feet per second	1.09728	kilometers per hour
Miles per hour	1.60935	kilometers per hour
Ohms per 1000 feet	3.28083	ohms per kilometer
Ohms per mile	.62137	ohms per kilometer
Decinels per 1000 feet	3.28083	decibels per kilometer
Decibels	.1153	nepers
MISCELLANEOUS		
Metric		
Kilograms per kilometer	.67197	pounds per 1000 ft.
Kilograms per kilometer	3.54795	pounds per mile
Kilograms per square millimeter	14.2234	pounds per inch
Kilograms per square centimeter	14.2234	pounds per square inch
Grams per cubic centimeter	.03613	pounds per cunic inch
Meters per minute	.05468	feet per second
Kilometers per minute	.91134	feet per second
kilometers per hour	.62137	miles per hour
Ohms per kilometer	.3048	ohms per 1000 feet
Ohms per kilometer	1.6093	ohms per mile
Decibels per kilometer	.3048	decibels per 1000 feet
Decibels per kilometer	1.6093	decibels per mile
Nepers	.1153	decibel
TEMPERATURE		
^{0}Fahrenheit	5/9(^{0}F.–32)	^{0}Celsius
^{0} Celsius	9/5 ^{0}(C.+32)	^{0} Fahrnheit

MULTIPLY	BY	TO OBTAIN
LENGTH - English		
Mils	.001	inches
Mils	.0254	millimeters
Inches	1000.	mils
Inches	25.40	millimeters
Inches	2.54	centimeters
Feet	30.48	meters
Feet (Thousands of)	.3048	kilometers
Yards	.9144	meters
Miles	1.6093	kilometers
LENGTH - Metric		
Millimeters	39.37	mils
Millimeters	.03937	inches
Centimeters	.3937	inches
Centimeters	.032808	feet
Meters	39.37	inches
Meters	3.2808	feet
Meters	1.0936	Yards
Kilometers	3280.83	feet
Kilometers	.62137	miles
AREA - English		
Square mils	1.2732	circular mils
Square mils	.000001	square inches
Circular mils	.7854	square mils
Circular mils	.0000007854	square millimeters
Circular mils	.0005067	square millimeters
Square inches	1000000	square mils
Square inches	1273240.	circular mils
Square inches	645.16	square millimeters
Square inches	6.4516	square centimeters
Square feet	.09290	square meters
Square yards	.8361	square meters
AREA - Metric		
Square millimeters	1973.52	circular mils
Square millimeters	.00155	square inches
Square centimeters	.155	square inches
Square meters	10.7638	square feet
Square meters	1.19599	square yards
VOLUME - English		
Cubic inches	16.38716	cubic centimeters
Cubic feet	.028317	cubic meters
Quarts(Liquid U.S.)	.9463	liters
Gallons(U.S.)	3.7854	liters
VOLUME - Metric		
Cubic centimeters	.06102	cubic inches
Cubic meters	35.3145	cubic feet
Liters	1.05668	quarts(Liquid U.S.)
Liters	.26417	U.S. Gallons

WOODEN DRUM

These drum are supplied as specified by the customer. Eritech prefers use of Steel Drums as packing media for its own use owing to environmental considerations.

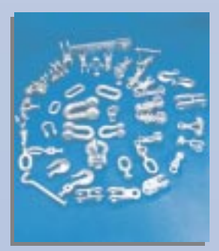
Flange Diameter	Barrel Diameter	Traverse	Bore Diameter
mm	mm	mm	mm
1050	550	450	82
1200	650	600	82
1400	800	600	82
1600	800	800	82
1600	800	700	82
1800	800	850	82

WIRE GAUGES

Gauge				Diameter		Sectional area			Aluminium wire weight
B.W.G.	A.W.G.	S.W.G.	mm.G	mil	mm	CM	in²	mm²	kg/km
5/0	-	7/0	-	500	12.700	250,000	0.1964	126.7	342.1
-	-	-	12	472.4	12.000	223,162	0.1753	113.1	305.4
-	-	6/0	-	464	11.786	215,296	0.1691	109.1	294.6
-	4/0	-	-	460	11.684	211,600	0.1662	107.2	289.4
4/0	-	-	-	454	11.532	206,100	0.1619	104.4	281.9
-	-	5/0	-	432	10.973	186,624	0.1466	94.56	255.3
3/0	-	-	-	425	10.795	180,600	0.1419	91.52	247.1
-	3/0	-	-	409.6	10.404	167,772	0.1318	85.03	229.6
-	-	4/0	-	400	10.160	160,000	0.1257	81.07	218.9
-	-	-	10	393.7	10.000	155,000	0.1217	78.54	212.1
2/0	-	-	-	380	9.652	144,400	0.1134	73.17	197.6
-	-	3/0	-	372	9.449	138,384	0.1087	70.12	189.3
-	2/0	-	-	364.8	9.266	138,079	0.1045	67.42	182.0
-	-	-	9	354.3	9.000	125,528	0.09859	63.62	171.8
-	-	2/0	-	348	8.839	121,104	0.09512	61.36	165.7
0	-	-	-	340	8.636	115,600	0.09079	58.58	158.2
-	0	-	-	324.9	8.250	105,560	0.08291	53.49	144.4
-	-	0	-	324	8.230	104,976	0.08245	53.19	134.6
-	-	-	8	315	8.000	99,225	0.07793	50.27	135.7
1	-	1	-	300	7.620	90,000	0.07069	45.60	123.1
-	1	-	-	289.3	7.348	83,694	0.06573	42.41	114.5
2	-	-	-	284	7.214	80,660	0.06335	40.87	110.3
-	-	2	-	276	7.010	76,176	0.05983	38.60	104.2
-	-	-	7	275.6	7.000	75,955	0.05966	38.48	103.9
3	-	-	-	259	6.579	67,080	0.05269	33.99	91.77
-	2	-	-	257.6	6.544	66,358	0.05212	33.63	90.80
-	-	-	6.5	255.9	6.500	65,485	0.05143	33.18	89.59
-	-	3	-	252	6.401	63,504	0.04988	32.18	86.89
4	-	-	-	238	6.045	56,640	0.04449	28.70	77.49
-	-	-	6.0	236.2	6.000	55,790	0.04382	28.27	76.33
-	-	4	-	232	5.893	53,824	0.04227	27.27	73.63
-	3	-	-	229.4	5.827	52,624	0.04133	26.66	71.98
5	-	-	-	220	5.588	48,400	0.03801	24.52	66.20
-	-	-	5.5	216.5	5.500	46,872	0.03681	23.72	64.04
-	-	5	-	212	5.385	44,944	0.0353	22.77	61.48
-	4	-	-	204.3	5.189	41,738	0.03278	21.15	57.11
6	-	-	-	203	5.156	41,210	0.03237	20.88	56.38
-	-	-	5.0	196.9	5.000	38,770	0.03945	19.63	53.00
-	-	6	-	192	4.877	36,864	0.02895	18.68	50.30
-	5	-	-	181.9	4.621	33,088	0.02599	16.77	45.28
7	-	-	-	180	4.572	32,400	0.02545	16.42	44.33
-	-	-	4.5	177.2	4.500	31,400	0.02466	15.90	42.93

WIRE GAUGES (Contd.)

Gauge				Diameter		Sectional area			Aluminium wire weight
B.W.G.	A.W.G.	S.W.G.	mm.G	mil	mm	CM	in²	mm²	kg/km
-	-	7	-	176	4.470	30,976	0.02433	15.70	42.39
8	-	-	-	165	4.191	27,220	0.02138	13.80	37.26
-	6	-	-	162	4.115	26,244	0.02061	13.30	35.91
-	-	8	-	160	4.064	25,600	0.02011	12.97	35.02
-	-	-	4.0	157.5	4.000	24,806	0.01948	12.57	33.94
9	-	-	-	148	3.759	21,900	0.0172	11.10	29.97
-	7	-	-	144.3	3.665	20,822	0.01635	10.55	28.49
-	-	9	-	144	3.658	20,736	0.01629	10.52	28.40
-	-	-	3.5	137.8	3.500	18,989	0.01491	9.621	25.98
10	-	-	-	134	3.404	17,960	0.01410	9.098	24.57
-	8	-	-	128.5	3.264	16,512	0.01297	8.368	22.59
-	-	10	-	128	3.251	16,384	0.01287	8.302	22.42
-	-	-	3.2	126	3.200	15,876	0.01247	8.042	21.71
11	-	-	-	120	3.048	14,400	0.01131	7.297	19.70
-	-	11	-	116	2.046	13,456	0.01057	6.818	18.41
-	9	-	-	114.4	2.906	13,087	0.01028	6.632	17.91
-	-	-	2.9	114.2	2.900	13,042	0.01024	6.605	17.83
12	-	-	-	109	2.769	11,880	0.008331	6.020	16.25
-	-	12	-	104	2.642	10,816	0.008495	5.481	14.80
-	-	-	2.6	102.4	2.600	10,486	0.008246	5.309	14.33
-	10	-	-	101.9	2.588	10,384	0.008156	5.262	14.21
13	-	-	-	95	2.413	9,025	0.007088	4.573	12.35
-	-	13	-	92	2.337	8,464	0.006648	4.289	11.58
-	11	-	-	90.74	2.305	8,234	0.006467	4.172	11.26
-	-	-	2.3	90.55	2.300	8,199	0.006439	4.155	11.22
14	-	-	-	83	2.108	6,889	0.005411	3.491	9.426
-	12	-	-	80.81	2.053	6,530	0.005129	3.309	8.934
-	-	14	-	80	2.032	6,400	0.005027	3.243	8.756
-	-	-	2.0	78.74	2.000	6,200	0.004869	3.142	8.483
15	-	15	-	72	1.829	5,184	0.004072	2.627	7.093
-	13	-	-	71.96	1.828	5,178	0.004067	2.624	7.085
-	-	-	1.8	70.87	1.800	5,023	0.003945	2.545	6.872
16	-	-	-	65	1.651	4,225	0.003318	2.141	5.781
-	14	-	-	64.08	1.628	4,106	0.003225	2.081	5.619
-	-	16	-	64	1.626	4,096	0.003217	2.075	5.603
-	-	-	1.6	62.99	1.600	3,968	0.003116	2.011	5.430
17	-	-	-	58	1.473	3,364	0.002642	1.705	4.604
-	15	-	-	57.07	1.450	3,257	0.002558	1.65	4.455
-	-	17	-	56	1,422	3,136	0.002463	1.589	4.290
-	-	-	1.4	55.12	1.400	3,038	0.002386	1.539	4.155
-	16	-	-	50.82	1.291	2,583	0.002029	1.309	3.534
18	-	-	-	49	1.245	2,401	0.001886	1.217	3.286
-	-	18	-	48	1.219	2,304	0.00181	1.167	3.151
-	-	-	1.2	47.24	1.200	2,232	0.001753	1.131	3.054
-	17	-	-	45.26	1.500	2,048	0.001608	1.037	2.800



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