



OVER HEAD LINE CONDUCTORS



دوكاب Ducab
Powering the Region





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INTRODUCTION:

Ducab Aluminium Company (DAC) is a joint venture between Senaat and its portfolio company Ducab.

DAC, which is manufacturing aluminium / aluminium alloy rods, wires, and bare overhead conductors, aims to capitalize on the growing market demand in the MENA region and expand globally.

Environment-friendly processes are employed within the mill, and liquid aluminium is supplied from the EMAL smelter in KIZAD, Abu Dhabi.

DAC products are one of the best in quality with technically advanced processes. The Aluminium rods are manufactured with continuous casting and rolling. The EC rods manufactured are with 99.7% minimum purity and conform the requirements of ASTM B233-97.



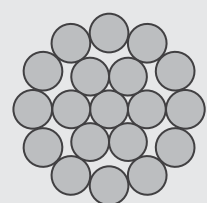
1. AAC

1.1 Description

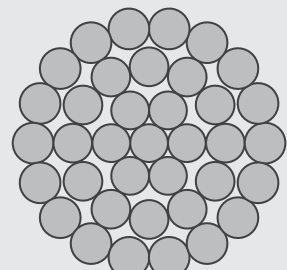
All Aluminium Conductor (AAC) is a concentric lay stranded conductor made with hard drawn Aluminium wires. Ducab Aluminium Company (DAC) can supply AAC as per different national and international standards to suit client requirements.



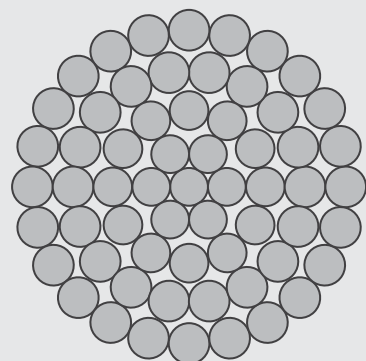
7 Wires 1+6



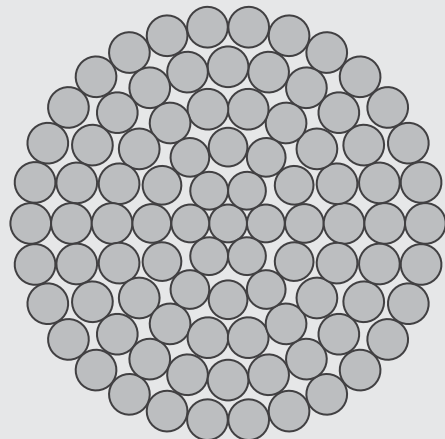
19 Wires 1+6+12



37 Wires 1+6+12+18



61 Wires 1+6+12+18+24



91 Wires 1+6+12+18+24+30

1.2 Application

AAC is used as bare overhead conductor for distribution lines.

These are extensively used in urban areas where high conductivity is required and span between poles is short.

1.3 Standards

AAC can be offered to meet various standards as mentioned below.

- BS 215 / 1
- IEC 61089
- ASTM B 231
- BS EN 50182

Apart from these we can offer AAC as per client specific design requirements.



1.4 Technical Data:

1.4.1

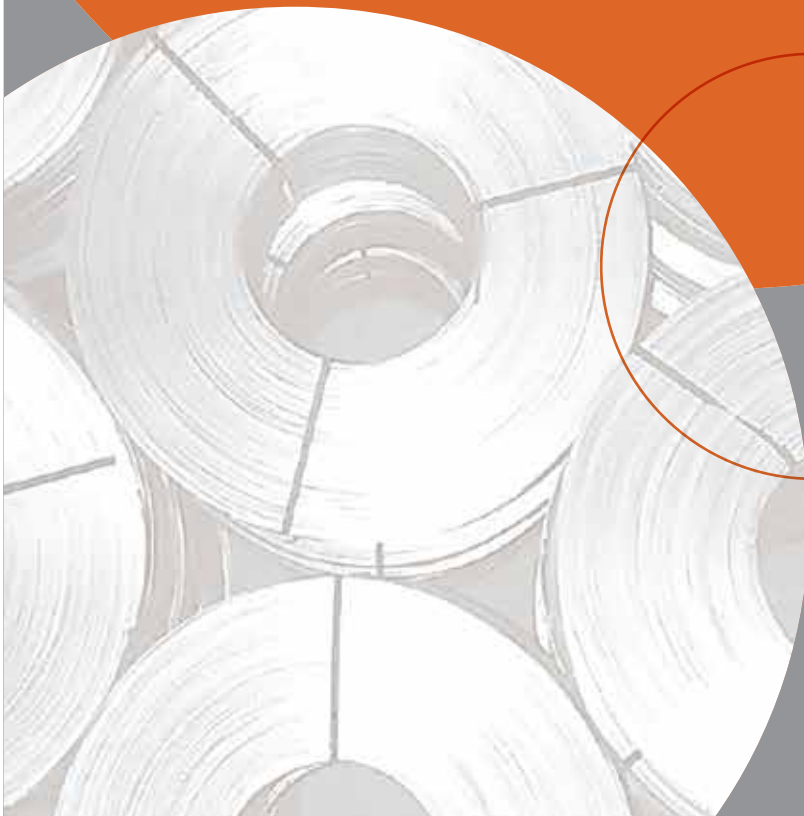
BS 215 / 1

Code name	Nominal Cross section Area	Conductor construction	Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	mm ²	No. x Dia. (mm)	mm	kg / km	Ω / km	KN
MIDGE	22	7 x 2.06	6.18	64	1.22700	3.99
ANT	50	7 x 3.10	9.30	145	0.54190	8.28
FLY	60	7 x 3.40	10.20	174	0.45050	9.90
WASP	100	7 x 4.39	13.17	290	0.27020	16.00
HORNET	150	19 x 3.25	16.25	434	0.18250	25.70
CHAFER	200	19 x 3.78	18.90	587	0.13490	32.40
COCKROACH	250	19 x 4.22	21.10	731	0.10830	40.40
BUTTERFLY	300	19 x 4.65	23.25	888	0.08916	48.75
CENTIPEDE	400	37 x 3.78	26.46	1145	0.06944	63.10

1.4.2

IEC 61089 A1 Conductors

Code name	Nominal Cross section Area	Conductor construction	Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	mm ²	No. x Dia. (mm)	mm	kg / km	Ω / km	KN
10	10	7 × 1.35	4.05	27.4	2.8633	1.95
16	16	7 × 1.71	5.12	43.8	1.78960	3.04
25	25	7 × 2.13	6.40	68.4	1.14530	4.50
40	40	7 × 2.70	8.09	109.4	0.71580	6.80
63	63	7 × 3.39	10.20	172.3	0.45450	10.39
100	100	19 × 2.59	12.90	274.8	0.28770	17.00
125	125	19 × 2.89	14.50	343.6	0.23020	21.25
160	160	19 × 3.27	16.40	439.8	0.17980	26.40
200	200	19 × 3.66	18.30	549.7	0.14390	32.00
250	250	19 × 4.09	20.50	687.1	0.11510	40.00
315	315	37 × 3.29	23.00	867.9	0.09160	51.97
400	400	37 × 3.71	26.00	1102.0	0.07210	64.00
450	450	37 × 3.94	27.50	1239.8	0.06410	72.00
500	500	37 × 4.15	29.00	1377.6	0.05770	80.00
560	560	37 × 4.39	30.70	1542.9	0.05150	89.60
630	630	61 × 3.63	32.60	1738.3	0.04580	100.80
710	710	61 × 3.85	34.60	1959.1	0.04070	113.60
800	800	61 × 4.09	36.80	2207.4	0.03610	128.00
900	900	61 × 4.33	39.00	2483.3	0.03210	144.00
1000	1000	61 × 4.57	41.10	2759.2	0.02890	160.00
1120	1120	91 × 3.96	43.50	3093.5	0.02580	179.20
1250	1250	91 × 4.18	46.0	3452.6	0.02310	200.00
1400	1400	91 × 4.43	48.7	3866.9	0.02070	224.00
1500	1500	91 × 4.58	50.4	4143.1	0.01930	240.00



1.4.3

ASTM B 231

Code name	Nominal Cross section Area	Conductor construction	Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	mm ²	No. x Dia. (mm)	mm	kg / km	Ω / km	KN
Peachbell	13.3	7 × 1.56	4.68	36.6	2.1477	2.53
Rose	21.1	7 × 1.96	5.88	58.2	1.3606	3.91
Iris	33.6	7 × 2.47	7.41	92.6	0.8567	5.99
Pansy	42.4	7 × 2.78	8.34	116.6	0.6763	7.3
Poppy	53.5	7 × 3.12	9.36	147.2	0.5369	8.84
Aster	67.4	7 × 3.50	10.5	185.7	0.4267	11.1
Phlox	85	7 × 3.93	11.79	233.9	0.3384	13.5
Oxlip	107.2	7 × 4.42	13.26	295.2	0.2675	17
Sneezewort	126.7	7 × 4.80	14.4	348.8	0.2269	20.1
Valerian	126.7	19 × 2.91	14.55	348.6	0.2274	20.7
Daisy	135.2	7 × 4.96	14.88	372.3	0.2125	21.4
Laurel	135.2	19 × 3.01	15.05	372.2	0.2125	22.1
Peony	152	19 × 3.19	15.95	418.3	0.1892	24.3
Tulip	170.5	19 × 3.38	16.9	469.5	0.1686	27.3
Daffodil	177.3	19 × 3.45	17.25	487.9	0.1618	28.4
Canna	201.4	19 × 3.67	18.35	554.9	0.1430	31.6
Goldentuft	228	19 × 3.91	19.55	627.6	0.1260	35
Cosmos	241.7	19 × 4.02	20.1	664.8	0.1192	37
Syringa	241.7	37 × 2.88	20.16	664.8	0.1192	38.6
Zinnia	253.3	19 × 4.12	20.6	697.1	0.1134	38.9
Hyacinth	253.3	37 × 2.95	20.65	696.8	0.1136	40.5
Dahlia	282	19 × 4.35	21.84	775.8	0.1018	43.3
Mistletoe	282	37 × 3.12	21.75	775.7	0.1016	44.3
Meadowsweet	304	37 × 3.23	22.61	836.3	0.0948	47.5
Orchid	322.3	37 × 3.33	23.31	886.9	0.0892	50.4
Heuchera	329.4	37 × 3.37	23.59	907.4	0.0871	51.7
Verbena	354.7	37 × 3.49	24.43	975.7	0.0812	55.4
Violet	362.6	37 × 3.53	24.71	998.5	0.0794	56.7
Flag	354.7	61 × 2.72	24.48	975.8	0.0811	57.1
Nasturtium	362.6	61 × 2.75	24.75	998.5	0.0793	58.4
Petunia	380	37 × 3.62	25.34	1046	0.0755	58.6
Cattail	380	61 × 2.82	25.38	1046	0.0754	60.3
Arbutus	402.8	37 × 3.72	26.04	1109	0.0715	61.8
Lilac	402.8	61 × 2.90	26.1	1110	0.0713	63.8
Cockscomb	456	37 × 3.96	27.72	1256	0.0631	68.4
Snapdragon	456	61 × 3.09	27.81	1256	0.0628	70.8
Magnolia	483.4	37 × 4.08	28.56	1331	0.0594	72.6
Goldenrod	483.4	61 × 3.18	28.62	1331	0.0593	75
Hawkweed	506.7	37 × 4.18	29.26	1395	0.0566	76.2
Camellia	506.7	61 × 3.25	29.25	1394	0.0568	78.3
Bluebell	523.7	37 × 4.25	29.75	1441	0.0547	78.8
Larkspur	523.7	61 × 3.31	29.79	1442	0.0547	81.3
Marigold	564	61 × 3.43	30.87	1553	0.0510	87.3
Hawthorn	604.2	61 × 3.55	31.95	1662	0.0476	93.5

Cont. 1.4.3

ASTM B 231

Code name	Nominal Cross section Area	Conductor construction	Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	mm ²	No. x Dia. (mm)	mm	kg / km	Ω / km	KN
Narcissus	644.5	61 x 3.67	33.03	1774	0.0445	98.1
Columbine	684.6	61 x 3.78	34.02	1884	0.0420	104
Carnation	725.1	61 x 3.89	35.01	1997	0.0396	108
Gladiolus	765.4	61 x 4.00	36	2108	0.0375	114
Coreopsis	805.7	61 x 4.10	36.9	2216	0.0357	120
Jessamine	886.7	61 x 4.30	38.7	2442	0.0324	132
Cowslip	1013	91 x 3.77	41.47	2787	0.0286	153
Sagebrush	1140	91 x 3.99	43.89	3166	0.0255	167
Lupine	1267	91 x 4.21	46.31	3519	0.0229	186
Bitterroot	1393	91 x 4.42	48.62	3872	0.0208	205
Trillium	1520	127 x 3.90	50.7	4226	0.0193	223
Bluebonnet	1773	127 x 4.22	54.86	4977	0.0165	261

1.4.4

BS EN 50182

Code name	Old Code name	Nominal Cross section Area	Conductor construction	Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
		mm ²	No. x Dia. (mm)	mm	kg / km	Ω / km	KN
23-AL1	MIDGE	23.3	7 x 2.06	6.18	63.8	1.2249	4.20
27-AL1	GNAT	26.9	7 x 2.21	6.63	73.4	1.064	4.83
37-AL1	MOSQUITO	36.9	7 x 2.59	7.77	100.8	0.7749	6.27
43-AL1	LADYBIRD	42.8	7 x 2.79	8.37	117.0	0.6678	7.28
53-AL1	ANT	52.8	7 x 3.10	9.30	144.4	0.5409	8.72
64-AL1	FLY	63.6	7 x 3.40	10.2	173.7	0.4497	10.49
74-AL1	BLUEBOTTLE	73.6	7 x 3.66	11.0	201.3	0.3880	11.78
79-AL1	EARWIG	78.6	7 x 3.78	11.3	214.7	0.3638	12.57
84-AL1	GRASSHOPPER	84.1	7 x 3.91	11.7	229.7	0.3400	13.45
96-AL1	CLEGG	95.6	7 x 4.17	12.5	261.3	0.2989	15.30
106-AL1	WASP	106.0	7 x 4.39	13.2	289.6	0.2697	16.95
106-AL1	BEETLE	106.4	19 x 2.67	13.4	292.4	0.2701	18.08
132-AL1	BEE	132.0	7 x 4.90	14.7	360.8	0.2165	21.12
158-AL1	HORNET	157.6	19 x 3.25	16.3	433.2	0.1823	26.01
186-AL1	CATERPILLAR	185.9	19 x 3.53	17.7	511.1	0.1546	29.75
213-AL1	CHAFER	213.2	19 x 3.78	18.9	586.0	0.1348	34.12
238-AL1	SPIDER	237.6	19 x 3.99	20.0	652.9	0.1210	38.01
266-AL1	COCKROACH	265.7	19 x 4.22	21.1	730.4	0.1081	42.52
323-AL1	BUTTERFLY	322.7	19 x 4.65	23.3	886.8	0.0891	51.63
373-AL1	MOTH	373.1	19 x 5.00	25.0	1025.3	0.0770	59.69
372-AL1	DRONE	372.4	37 x 3.58	25.1	1027.1	0.0774	59.59
415-AL1	CENTIPEDE	415.2	37 x 3.78	26.5	1145.1	0.0695	66.43
486-AL1	MAYBUG	486.1	37 x 4.09	28.6	1340.6	0.0593	77.78
530-AL1	SCORPION	529.8	37 x 4.27	29.9	1461.2	0.0544	84.77
628-AL1	CICADA	628.3	37 x 4.65	32.6	1732.9	0.0459	100.45

2. ACSR

2.1 Description

Aluminium Conductor Steel reinforced (ACSR) is concentric lay stranded conductor with galvanized steel central core and one or more layers of hard drawn Aluminium wires laid helically over the steel core. The steel wires are galvanized to get corrosion protection.

We can provide a coating of non-oxidising grease on steel core when required.

2.2 Application

These are used in medium, high and extra-high voltage transmission lines.

The combination of Aluminium and steel provides both efficient conductivity and high tensile strength.

2.3 Standards

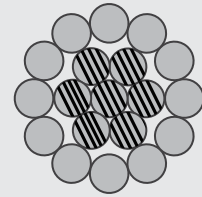
ACSR can be offered to meet various standards as mentioned below.

- BS 215 / 2
- IEC 61089
- ASTM B 232/B 232M
- BS EN 50182
- DIN 48204

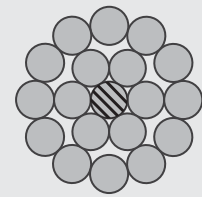
Apart from these we can offer ACSR as per client specific design requirements.



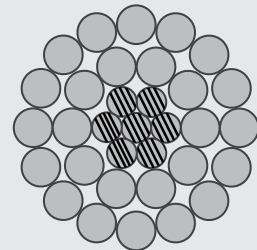
6/1 Wires



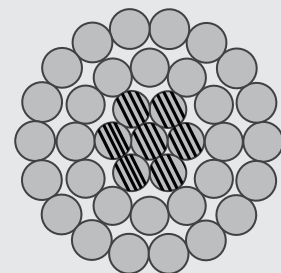
12/7 Wires



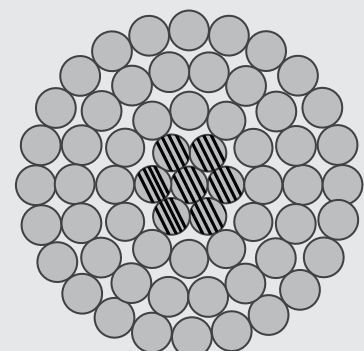
18/1 Wires



26/7 Wires



30/7 Wires



54/7 Wires

2.4 Technical Data:

2.4.1

BS215/2

Code name	Nominal Cross section Area	Conductor construction		Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
		Aluminium	Steel				
	mm ²	No. x Dia. (mm)		mm	kg / km	Ω / km	KN
GOPHER	25	6 x 2.36	1 x 2.36	7.08	106	1.09300	9.61
WEASEL	30	6 x 2.59	1 x 2.59	7.77	128	0.90770	11.45
FERRET	40	6 x 3.00	1 x 3.00	9.00	172	0.67660	15.20
RABBIT	50	6 x 3.35	1 x 3.35	10.05	214	0.54260	18.35
HORSE	70	12 x 2.79	7 x 2.79	13.95	538	0.39360	61.20
DOG	100	6 x 4.72	7 x 1.57	14.15	394	0.27330	32.70
WOLF	150	30 x 2.59	7 x 2.59	18.13	726	0.18280	69.20
DINGO	150	18 x 3.35	1 x 3.35	16.75	506	0.18150	35.70
LYNX	175	30 x 2.79	7 x 2.79	19.53	842	0.15760	79.80
CARACAL	175	18 x 3.61	1 x 3.61	18.05	587	0.15630	41.10
PANTHER	200	30 x 3.00	7 x 3.00	21.00	974	0.13630	92.25
JAGUAR	200	18 x 3.86	1 x 3.86	19.30	671	0.13670	46.55
ZEBRA	400	54 x 3.18	7 x 3.18	28.62	1621	0.06740	131.90



2.4.2

IEC 61089 A1 / S1A Conductors

Code Name	Nominal Cross section Area		Conductor construction		Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	Aluminium	Steel	Aluminium	Steel				
	mm ²		No. x Dia. (mm)		mm	kg / km	Ω / km	KN
16	16	2.67	6 x 1.84	1 x 1.84	5.53	64.6	1.79340	6.08
25	25	4.17	6 x 2.30	1 x 2.30	6.91	100.9	1.14780	9.13
40	40	6.67	6 x 2.91	1 x 2.91	8.74	161.5	0.71740	14.40
63	63	10.50	6 x 3.66	1 x 3.66	11.00	254.4	0.45550	21.63
100	100	16.70	6 x 4.61	1 x 4.61	13.80	403.8	0.28690	34.33
125	125	6.94	18 x 2.97	1 x 2.97	14.90	397.9	0.23040	29.17
125	125	20.40	26 x 2.47	7 x 1.92	15.70	503.9	0.23100	45.69
160	160	8.89	18 x 3.36	1 x 3.36	16.80	509.3	0.18000	36.18
160	160	26.10	26 x 2.80	7 x 2.18	17.70	644.9	0.18050	57.69
200	200	11.10	18 x 3.76	1 x 3.76	18.80	636.7	0.14400	44.22
200	200	32.60	26 x 3.13	7 x 2.43	19.80	806.2	0.14440	70.13
250	250	24.60	22 x 3.80	7 x 2.11	21.60	880.6	0.11540	68.72
250	250	40.70	26 x 3.50	7 x 2.72	22.20	1007.7	0.11550	87.67
315	315	21.80	45 x 2.99	7 x 1.99	23.90	1039.6	0.09170	79.03
315	315	51.30	26 x 3.93	7 x 3.05	24.90	1269.7	0.09170	106.83
400	400	27.70	45 x 3.36	7 x 2.24	26.90	1320.1	0.07220	98.36
400	400	51.90	54 x 3.07	7 x 3.07	27.60	1510.3	0.07230	123.04
450	450	31.10	45 x 3.57	7 x 2.38	28.50	1485.2	0.06420	107.47
450	450	58.30	54 x 3.26	7 x 3.26	29.30	1699.1	0.06430	138.42
500	500	34.60	45 x 3.76	7 x 2.51	30.10	1650.2	0.05780	119.41
500	500	64.80	54 x 3.43	7 x 3.43	30.90	1887.9	0.05780	153.50
560	560	38.70	45 x 3.98	7 x 2.65	31.80	1848.2	0.05160	133.74
560	560	70.90	54 x 3.63	19 x 2.18	32.70	2103.4	0.05160	172.59
630	630	43.60	45 x 4.22	7 x 2.81	33.80	2079.2	0.04590	150.45
630	630	79.80	54 x 3.85	19 x 2.31	34.70	2366.3	0.04590	191.77
710	710	49.10	45 x 4.48	7 x 2.99	35.90	2343.2	0.04070	169.56
710	710	89.90	54 x 4.09	19 x 2.45	36.80	2666.8	0.04070	216.12
800	800	34.60	72 x 3.76	7 x 2.51	37.60	2480.2	0.03610	167.41
800	800	66.70	84 x 3.48	7 x 3.48	38.30	2732.7	0.03620	205.33
800	800	101.0	54 x 4.34	19 x 2.61	39.10	3004.9	0.03620	243.52
900	900	38.90	72 x 3.99	7 x 2.66	39.90	2790.2	0.03210	188.33
900	900	75.00	84 x 3.69	7 x 3.69	40.60	3074.2	0.03220	226.50
1000	1000	43.20	72 x 4.21	7 x 2.80	42.10	3100.3	0.02890	209.26
1120	1120	47.30	72 x 4.45	19 x 1.78	44.50	3464.9	0.02580	234.53
1120	1120	91.20	84 x 4.12	19 x 2.47	45.30	3811.5	0.02580	283.17
1250	1250	102.0	84 x 4.35	19 x 2.61	47.90	4253.9	0.02320	316.04
1250	1250	52.80	72 x 4.70	19 x 1.88	47.00	3867.1	0.02310	261.75

2.4.3

ASTM B 232/B 232M

Code Name	Nominal Cross section Area		Conductor construction		Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	Aluminium	Steel	Aluminium	Steel				
	mm ²		No. x Dia. (mm)		mm	kg / km	Ω / km	KN
Turkey	13.30	2.22	6 x 1.68	1 x 1.68	5.04	53.6	2.1499	5.28
Swan	21.18	3.35	6 x 2.12	1 x 2.12	6.36	85.3	1.3501	8.30
Swanate	21.12	5.35	7 x 1.96	1 x 2.61	6.53	99.6	1.3539	10.53
Sparrow	33.59	5.60	6 x 2.67	1 x 2.67	8.01	135.7	0.8512	12.69
Sparate	33.54	8.55	7 x 2.47	1 x 3.30	8.24	158.7	0.8525	16.14
Grouse	40.54	14.12	8 x 2.54	1 x 4.24	9.32	221.4	0.7089	22.86
Robin	42.41	7.07	6 x 3.00	1 x 3.00	9.00	171.1	0.6742	15.81
Petrel	51.61	30.10	12 x 2.34	7 x 2.34	11.70	377.7	0.5595	46.16
Raven	53.52	8.92	6 x 3.37	1 x 3.37	10.11	216.1	0.5343	19.35
Minorca	56.11	32.73	12 x 2.44	7 x 2.44	12.20	411.1	0.5146	50.19
Quail	67.33	11.22	6 x 3.78	1 x 3.78	11.34	272.0	0.4247	23.27
Leghorn	68.20	39.78	12 x 2.69	7 x 2.69	13.45	499.2	0.4234	60.67
Guinea	80.36	46.88	12 x 2.92	7 x 2.92	14.60	549.5	0.3593	71.10
Pigeon	85.12	14.19	6 x 4.25	1 x 4.25	12.75	343.0	0.3359	29.42
Dotterel	89.41	52.15	12 x 3.08	7 x 3.08	15.40	656.1	0.3230	76.68
Dorking	96.51	56.30	12 x 3.20	7 x 3.20	16.00	707.8	0.2992	82.77
Brahma	102.79	91.78	16 x 2.86	19 x 2.48	18.12	1003.8	0.2809	126.52
Cochin	107.04	62.44	12 x 3.37	7 x 3.37	16.85	783.9	0.2698	91.79
Penguin	107.22	17.87	6 x 4.77	1 x 4.77	14.31	432.7	0.2667	37.06
Waxwing	134.98	7.50	18 x 3.09	1 x 3.09	15.45	430.2	0.2129	30.27
Partridge	134.87	21.99	26 x 2.57	7 x 2.00	16.28	545.9	0.2141	50.23
Ostrich	152.19	24.71	26 x 2.73	7 x 2.12	17.28	613.4	0.1897	56.55
Merlin	170.22	9.46	18 x 3.47	1 x 3.47	17.35	542.8	0.1688	38.17
Linnet	170.55	27.83	26 x 2.89	7 x 2.25	18.31	687.5	0.1693	62.76
Oriole	170.50	39.78	30 x 2.69	7 x 2.69	18.83	783.3	0.1698	77.43
Chickadee	200.93	11.16	18 x 3.77	1 x 3.77	18.85	641.3	0.1430	43.37
Brant	201.56	26.13	24 x 3.27	7 x 2.18	19.62	761.0	0.1433	64.72
Ibbs	201.34	32.73	26 x 3.14	7 x 2.44	19.88	812.4	0.1434	72.05
Lark	200.90	46.88	30 x 2.92	7 x 2.92	20.44	925.2	0.1441	90.30
Pelican	242.31	13.46	18 x 4.14	1 x 4.14	20.70	769.7	0.1186	52.30
Flicker	241.58	31.40	24 x 3.58	7 x 2.39	21.49	913.5	0.1195	76.78
Hawk	241.65	39.19	26 x 3.44	7 x 2.67	21.77	975.1	0.1195	86.36
Hen	241.27	56.30	30 x 3.20	7 x 3.20	22.40	1110.6	0.1200	105.16
Osprey	282.47	15.69	18 x 4.47	1 x 4.47	22.35	897.7	0.1017	60.97
Parakeet	282.31	36.60	24 x 3.87	7 x 2.58	23.22	1065.6	0.1023	88.29
Dove	282.59	45.92	26 x 3.72	7 x 2.89	23.55	1138.6	0.1022	101.10
Eagle	282.07	65.82	30 x 3.46	7 x 3.46	24.22	1295.6	0.1026	122.94
Peacock	306.13	39.78	24 x 4.03	7 x 2.69	24.19	1158.9	0.0943	95.86
Squab	305.83	49.81	26 x 3.87	7 x 3.01	24.51	1237.0	0.0944	108.14
Wood Duck	307.06	71.65	30 x 3.61	7 x 3.61	25.27	1408.4	0.0943	129.02
Teal	307.06	69.62	30 x 3.61	19 x 2.16	25.24	1396.6	0.0943	133.37
Kingbird	323.01	17.95	18 x 4.78	1 x 4.78	23.90	1026.6	0.0890	69.72
Swift	323.02	8.97	36 x 3.38	1 x 3.38	23.66	956.5	0.0890	60.65
Rook	323.07	41.88	24 x 4.14	7 x 2.76	24.84	1217.5	0.0894	101.04

Cont. 2.4.3

ASTM B 232/B 232M

Code Name	Nominal Cross section Area		Conductor construction		Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	Aluminium	Steel	Aluminium	Steel				
	mm ²		No. x Dia. (mm)		mm	kg / km	Ω / km	KN
Grosbeak	321.84	52.49	26 x 3.97	7 x 3.09	25.15	1300.8	0.0897	111.87
Scoter	322.56	75.26	30 x 3.70	7 x 3.70	25.90	1480.7	0.0897	135.53
Egret	322.56	73.54	30 x 3.70	19 x 2.22	25.90	1469.0	0.0897	140.60
Flamingo	337.27	43.72	24 x 4.23	7 x 2.82	25.38	1276.6	0.0856	105.48
Gannet	338.26	54.90	26 x 4.07	7 x 3.16	25.76	1363.3	0.0854	117.26
Stilt	363.27	46.88	24 x 4.39	7 x 2.92	26.32	1370.4	0.0795	113.35
Starling	361.93	59.15	26 x 4.21	7 x 3.28	26.68	1463.7	0.0798	125.95
Redwing	362.06	82.41	30 x 3.92	19 x 2.35	27.43	1650.6	0.0799	153.66
Coot	401.86	11.16	36 x 3.77	1 x 3.77	26.39	1195.8	0.0715	72.88
Cuckoo	402.33	52.15	24 x 4.62	7 x 3.08	27.74	1522.2	0.0718	123.82
Drake	402.56	65.44	26 x 4.44	7 x 3.45	28.11	1626.4	0.0717	139.67
Tern	403.77	27.83	45 x 3.38	7 x 2.25	27.03	1331.8	0.0715	97.47
Condor	402.33	52.15	54 x 3.08	7 x 3.08	27.72	1520.7	0.0718	124.33
Mallard	403.84	91.78	30 x 4.14	19 x 2.48	28.96	1836.0	0.0717	171.22
Ruddy	455.50	31.67	45 x 3.59	7 x 2.40	28.73	1507.3	0.0634	109.38
Canary	456.28	59.15	54 x 3.28	7 x 3.28	29.52	1723.1	0.0633	141.00
Catbird	484.61	13.46	36 x 4.14	1 x 4.14	28.98	1434.4	0.0593	87.88
Rail	483.84	33.54	45 x 3.70	7 x 2.47	29.61	1598.1	0.0597	116.07
Cardinal	484.53	62.81	54 x 3.38	7 x 3.38	30.42	1825.9	0.0596	149.72
Tanager	522.79	14.52	36 x 4.30	1 x 4.30	30.12	1553.5	0.0550	94.81
Ortolan	523.87	36.31	45 x 3.85	7 x 2.57	30.81	1730.5	0.0551	123.28
Curlew	522.51	67.73	54 x 3.51	7 x 3.51	31.62	1977.6	0.0553	161.46
Bluejay	565.49	38.90	45 x 4.00	7 x 2.66	31.98	1866.0	0.0511	132.71
Finch	565.03	71.57	54 x 3.65	19 x 2.19	32.85	2127.8	0.0514	174.60
Bunting	605.76	41.88	45 x 4.14	7 x 2.76	33.12	1996.9	0.0477	142.42
Grackle	602.79	76.89	54 x 3.77	19 x 2.27	33.97	2278.1	0.0481	184.19
Skylark	646.02	17.95	36 x 4.78	1 x 4.78	33.46	1913.6	0.0445	117.16
Bittern	644.40	44.66	45 x 4.27	7 x 2.85	34.16	2130.8	0.0448	151.63
Pheasant	645.08	81.71	54 x 3.90	19 x 2.34	35.10	2431.4	0.0450	194.13
Dipper	684.24	47.20	45 x 4.40	7 x 2.93	35.19	2263.2	0.0422	160.74
Martin	685.39	86.67	54 x 4.02	19 x 2.41	36.17	2581.7	0.0423	206.08
Bobolink	725.27	50.14	45 x 4.53	7 x 3.02	36.24	2397.2	0.0398	170.51
Plover	726.92	91.78	54 x 4.14	19 x 2.48	37.24	2734.9	0.0399	218.40
Nuthatch	764.20	52.83	45 x 4.65	7 x 3.10	37.20	2529.6	0.0378	177.64
Parrot	766.06	97.03	54 x 4.25	19 x 2.55	38.25	2883.7	0.0379	230.53
Lapwing	807.53	55.60	45 x 4.78	7 x 3.18	38.20	2663.5	0.0358	187.43
Falcon	806.23	102.43	54 x 4.36	19 x 2.62	39.26	3038.5	0.0360	242.99
Chukar	903.18	73.54	84 x 3.70	19 x 2.22	40.70	3083.1	0.0321	227.79
Bluebird	1092.84	88.84	84 x 4.07	19 x 2.44	44.76	3731.9	0.0266	268.05
Kiwi	1099.76	47.52	72 x 4.41	7 x 2.94	44.10	3423.9	0.0264	221.71
Thrasher	1171.42	63.94	76 x 4.43	19 x 2.07	45.79	3754.2	0.0248	251.86

2.4.4

BS EN 50182

Code name	Old Code Name	Nominal Cross section Area		Conductor construction		Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
		Aluminium	Steel	Aluminium	Steel				
		mm ²		No. x Dia. (mm)		mm	kg / km	Ω / km	KN
11-AL1/2-ST1A	MOLE	10.6	1.77	6x1.5	1x1.5	4.50	42.8	2.7027	4.14
21-AL1/3-ST1A	SQUIRREL	21.0	3.50	6x2.11	1x2.11	6.33	84.7	1.3659	7.87
26-AL1/4-ST1A	GOPHER	26.2	4.37	6x2.36	1x2.36	7.08	106.0	1.0919	9.58
32-AL1/5-ST1A	WEASEL	31.6	5.27	6x2.59	1x2.59	7.77	127.6	0.9065	11.38
37-AL1/6-ST1A	FOX	36.7	6.11	6x2.79	1x2.79	8.37	148.1	0.7812	13.21
42-AL1/7-ST1A	FERRET	42.4	7.07	6x3.00	1x3.00	9.00	171.2	0.6757	15.27
53-AL1/9-ST1A	RABBIT	52.9	8.81	6x3.35	1x3.35	10.1	213.5	0.5419	18.42
63-AL1/11-ST1A	MINK	63.1	10.5	6x3.66	1x3.66	11.0	254.9	0.4540	21.67
63-AL1/37-ST1A	SKUNK	63.2	36.9	12x2.59	7x2.59	13.0	463.0	0.4568	52.79
75-AL1/13-ST1A	BEAVER	75.0	12.5	6x3.99	1x3.99	12.0	302.9	0.3820	25.76
73-AL1/43-ST1A	HORSE	73.4	42.8	12x2.79	7x2.79	14.0	537.3	0.3936	61.26
79-AL1/13-ST1A	RACCOON	78.8	13.1	6x4.09	1x4.09	12.3	318.3	0.3635	27.06
84-AL1/14-ST1A	OTTER	83.9	14.0	6x4.22	1x4.22	12.7	338.8	0.3415	28.81
95-AL1/16-ST1A	CAT	95.4	15.9	6x4.50	1x4.50	13.5	385.3	0.3003	32.76
105-AL1/17-ST1A	HARE	105.0	17.5	6x4.72	1x4.72	14.2	423.8	0.2730	36.04
105-AL1/14-ST1A	DOG	105.0	13.6	6x4.72	7x1.57	14.2	394.0	0.2733	32.65
132-AL1/20-ST1A	COYOTE	131.7	20.1	26x2.54	7x1.91	15.9	520.7	0.2192	45.86
132-AL1/7-ST1A	COUGAR	131.5	7.31	18x3.05	1x3.05	15.3	418.8	0.2188	29.74
131-AL1/31-ST1A	TIGER	131.2	30.6	30x2.36	7x2.36	16.5	602.2	0.2202	57.87
158-AL1/37-ST1A	WOLF	158.1	36.9	30x2.59	7x2.59	18.1	725.3	0.1829	68.91
159-AL1/9-ST1A	DINGO	157.7	8.81	18x3.35	1x3.35	16.8	505.2	0.1814	35.87
183-AL1/43-ST1A	LYNX	183.4	42.8	30x2.79	7x2.79	19.5	841.6	0.1576	79.97
184-AL1/10-ST1A	CARACAL	183.2	10.2	18x3.61	1x3.61	18.1	586.7	0.1562	40.74
212-AL1/49-ST1A	PANTHER	212.1	49.5	30x3.00	7x3.00	21.0	973.1	0.1363	92.46
211-AL1/12-ST1A	JAGUAR	210.6	11.7	18x3.86	1x3.86	19.3	670.8	0.1366	46.57
238-AL1/56-ST1A	LION	238.3	55.6	30x3.18	7x3.18	22.3	1093.4	0.1213	100.47
264-AL1/62-ST1A	BEAR	264.4	61.7	30x3.35	7x3.35	23.5	1213.4	0.1093	111.50
324-AL1/76-ST1A	GOAT	324.3	75.7	30x3.71	7x3.71	26.0	1448.2	0.0891	135.13
375-AL1/88-ST1A	SHEEP	375.1	87.5	30x3.99	7x3.99	27.9	1721.3	0.0771	156.30
374-AL1/48-ST1A	ANTELOPE	374.1	48.5	54x2.97	7x2.97	26.7	1413.8	0.0773	118.88
382-AL1/49-ST1A	BISON	381.7	49.5	54x3.00	7x3.00	27.0	1442.5	0.0758	121.30
430-AL1/100-ST1A	DEER	429.6	100.2	30x4.27	7x4.27	29.9	1971.4	0.0673	179.00
429-AL1/56-ST1A	ZEBRA	428.9	55.6	54x3.18	7x3.18	28.6	1620.8	0.0674	131.92
477-AL1/111-ST1A	ELK	477.1	111.3	30x4.50	7x4.50	31.5	2189.5	0.0606	198.80
476-AL1/62-ST1A	CAMEL	476.0	61.7	54x3.35	7x3.35	30.2	1798.8	0.0608	146.40
528-AL1/69-ST1A	MOOSE	528.5	68.5	54x3.53	7x3.53	31.8	1997.3	0.0547	159.92



2.4.5

DIN 48204

Code Name	Nominal Cross section Area		Conductor construction		Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	Aluminium	Steel	Aluminium	Steel				
	mm ²		No. x Dia. (mm)		mm	kg / km	Ω / km	KN
16 / 2,5	15,27	2,54	6 x 1,80	1 x 1,80	5,4	62	1,87930	5,81
25 / 4	23,86	3,98	6 x 2,25	1 x 2,25	6,8	97	1,20280	9,02
35 / 6	34,35	5,73	6 x 2,70	1 x 2,70	8,1	140	0,83530	12,70
44 / 32	43,98	31,67	14 x 2,00	7 x 2,40	11,2	373	0,65730	45,46
50 / 8	48,25	8,04	6 x 3,20	1 x 3,20	9,6	196	0,59460	17,18
50 / 30	51,17	29,85	12 x 2,33	7 x 2,33	11,7	378	0,56440	44,28
70 / 12	69,89	11,40	26 x 1,85	7 x 1,44	11,7	284	0,41300	26,31
95 / 15	94,39	15,33	26 x 2,15	7 x 1,67	13,6	383	0,30580	35,17
95 / 55	96,61	66,30	12 x 3,20	7 x 3,20	16,0	714	0,29920	80,20
105 / 75	105,67	75,55	14 x 3,10	19 x 2,25	17,5	899	0,27360	106,69
120 / 20	121,57	19,85	26 x 2,44	7 x 1,90	15,5	494	0,23740	44,94
120 / 70	122,15	71,25	12 x 3,60	7 x 3,60	18,0	904	0,23640	98,16
125 / 30	127,92	29,85	30 x 2,33	7 x 2,33	16,3	590	0,22590	57,86
150 / 25	148,86	24,25	26 x 2,70	7 x 2,10	17,1	604	0,19390	54,37
170 / 40	171,77	40,08	30 x 2,70	7 x 2,70	18,9	794	0,16820	77,01
185 / 30	183,78	29,85	26 x 3,00	7 x 2,33	19,0	744	0,15710	66,28
210 / 35	209,10	34,09	26 x 3,20	7 x 2,49	20,3	848	0,13800	74,94
210 / 50	212,06	49,48	30 x 3,00	7 x 3,00	21,0	979	0,13630	92,25
230 / 30	230,91	28,85	24 x 3,50	7 x 2,33	21,0	874	0,12490	73,09
240 / 40	243,05	39,49	26 x 3,45	7 x 2,68	21,8	985	0,11880	86,46
265 / 35	263,66	34,09	24 x 3,74	7 x 2,49	22,4	998	0,10940	82,94
300 / 50	304,26	49,48	26 x 3,85	7 x 3,00	24,5	1233	0,09490	105,09
305 / 40	304,62	39,49	54 x 2,68	7 x 2,68	24,1	1155	0,09490	99,30
340 / 30	339,29	29,85	48 x 3,00	7 x 2,33	25,0	1174	0,08510	92,56
380 / 50	381,70	49,48	54 x 3,00	7 x 3,00	27,0	1448	0,07570	120,91
385 / 35	386,04	34,09	48 x 3,20	7 x 2,49	26,7	1336	0,07480	104,31
435 / 55	434,29	56,30	54 x 3,20	7 x 3,20	28,8	1647	0,06660	136,27
450 / 40	448,71	39,49	48 x 3,45	7 x 2,68	28,7	1553	0,06440	120,19
490 / 65	490,29	63,55	54 x 3,40	7 x 3,40	30,6	1860	0,05900	152,85
495 / 35	494,36	34,09	45 x 3,74	7 x 2,49	29,9	1636	0,05840	120,31
510 / 45	510,54	45,28	48 x 3,68	7 x 2,87	30,7	1770	0,05660	134,33
550 / 70	549,65	71,25	54 x 3,60	7 x 3,60	32,4	2085	0,05260	167,42
560 / 50	561,7	49,48	48 x 3,86	7 x 3,00	32,2	1943	0,05140	146,28
570 / 40	571,16	39,49	45 x 4,02	7 x 2,68	32,2	1889	0,05060	137,98
650 / 45	653,49	45,28	45 x 4,30	7 x 2,87	34,4	2163	0,04420	155,52
680 / 85	678,58	85,95	54 x 4,00	19 x 2,40	36,0	2564	0,04260	209,99



3. ACSR/AW

3.1 Description

The ACSR/AW is similar to ACSR, but with aluminium-clad steel core in the center in place of galvanized steel core. Thus, Aluminum Conductors, Aluminum-Clad Steel Reinforced (ACSR/AW) is a concentric-layer-stranded conductor consisting of aluminum-clad steel central core (Alumoweld) with one or more layers of hard drawn stranded aluminum wires. Alumoweld is a high tensile steel wire/s, covered with a specified coating of pure aluminum.

The design and dimensions of ACSR/AW conductors are identical to those of standard ACSR conductors.

3.2 Application

ACSR/AW is used in Medium, High and Extra-High voltage transmission lines. In comparison with ACSR conductors, ACSR/AW conductors have certain technical advantages in overhead lines. It has lower weight and higher current carrying capacity.

Also it offers reduction in energy losses and significant cost saving during the operation of the line.

3.3 Standards

- ASTM B 549

We can supply ACSR/AW as per any other client specific requirements.



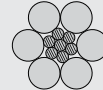
6/1 Wires



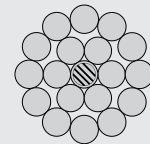
7/1 Wires



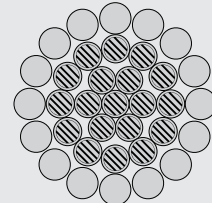
8/1 Wires



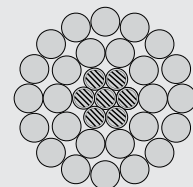
6/7 Wires



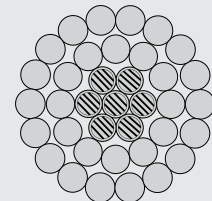
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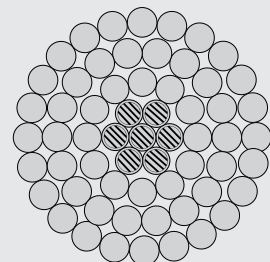
16/19 Wires



26/7 Wires



30/7 Wires



54/7 Wires

3.4 Technical Data:

3.4.1

ASTM B 549

Code Name	Nominal Cross section Area		Conductor construction		Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	Aluminium	Steel	Aluminium	Steel				
	mm ²		No. x Dia. (mm)		mm	kg / km	Ω / km	KN
Swan/AW	21.18	3.35	6 x 2.12	1 x 2.12	6.36	81.0	1.28227	8.0
Swanate/AW	21.12	5.35	7 x 1.96	1 x 2.61	6.53	93.0	1.25114	10.0
Sparrow/AW	33.59	5.60	6 x 2.67	1 x 2.67	8.01	129.0	0.80840	12.0
Sparate/AW	33.54	8.55	7 x 2.47	1 x 3.30	8.24	149.0	0.78740	16.0
Grouse/AW	40.54	14.12	8 x 2.54	1 x 4.24	9.32	205.0	0.63591	22.0
Robin/AW	42.41	7.07	6 x 3.00	1 x 3.00	9.00	162.0	0.64034	15.0
Petrel/AW	51.61	30.10	12 x 2.34	7 x 2.34	11.70	342.0	0.46842	44.0
Raven/AW	53.52	8.92	6 x 3.37	1 x 3.37	10.11	205.0	0.50745	19.0
Minorca/AW	56.11	32.73	12 x 2.44	7 x 2.44	12.20	372.0	0.43081	48.0
Quail/AW	67.33	11.22	6 x 3.78	1 x 3.78	11.34	259.0	0.40334	23.0
Leghorn/AW	68.20	39.78	12 x 2.69	7 x 2.69	13.45	452.0	0.35445	58.0
Guinea/AW	80.36	46.88	12 x 2.92	7 x 2.92	14.60	534.0	0.30081	68.0
Pigeon/AW	85.12	14.19	6 x 4.25	1 x 4.25	12.75	326.0	0.31906	28.0
Dotterel/AW	89.41	52.15	12 x 3.08	7 x 3.08	15.40	594.0	0.27037	75.0
Dorking/AW	96.51	56.30	12 x 3.20	7 x 3.20	16.00	641.0	0.25047	81.0
Brahma/AW	102.79	91.78	16 x 2.86	19 x 2.48	18.12	894.0	0.21628	121.0
Cochin/AW	107.04	62.44	12 x 3.37	7 x 3.37	16.85	710.0	0.22584	88.0
Penguin/AW	107.22	17.87	6 x 4.77	1 x 4.77	14.31	412.0	0.25329	34.0
Waxwing/AW	134.98	7.50	18 x 3.09	1 x 3.09	15.45	421.0	0.20963	30.0
Partridge/AW	134.87	21.99	26 x 2.57	7 x 2.00	16.28	519.0	0.20351	48.0
Ostrich/AW	152.19	24.71	26 x 2.73	7 x 2.12	17.28	583.0	0.18040	54.0
Merlin/AW	170.22	9.46	18 x 3.47	1 x 3.47	17.35	531.0	0.16623	38.0
Linnet/AW	170.55	27.83	26 x 2.89	7 x 2.25	18.31	655.0	0.16093	60.0
Oriole/AW	170.50	39.78	30 x 2.69	7 x 2.69	18.83	737.0	0.15778	74.0
Chickadee/AW	200.93	11.16	18 x 3.77	1 x 3.77	18.85	628.0	0.14082	44.0
Brant/AW	201.56	26.13	24 x 3.27	7 x 2.18	19.62	731.0	0.13767	63.0
Ibbs/AW	201.34	32.73	26 x 3.14	7 x 2.44	19.88	774.0	0.13635	70.0
Lark/AW	200.90	46.88	30 x 2.92	7 x 2.92	20.44	869.0	0.13390	87.0
Pelican/AW	242.31	13.46	18 x 4.14	1 x 4.14	20.70	755.0	0.11678	51.0
Flicker/AW	241.58	31.40	24 x 3.58	7 x 2.39	21.49	877.0	0.11484	74.0
Hawk/AW	241.65	39.19	26 x 3.44	7 x 2.67	21.77	929.0	0.11358	84.0
Hen/AW	241.27	56.30	30 x 3.20	7 x 3.20	22.40	1043.0	0.11150	104.0
Osprey/AW	282.47	15.69	18 x 4.47	1 x 4.47	22.35	880.0	0.10017	59.0
Parakeet/AW	282.31	36.60	24 x 3.87	7 x 2.58	23.22	1022.0	0.09829	86.0
Dove/AW	282.59	45.92	26 x 3.72	7 x 2.89	23.55	1083.0	0.09715	97.0
Eagle/AW	282.07	65.82	30 x 3.46	7 x 3.46	24.22	1217.0	0.09537	119.0
Peacock/AW	306.13	39.78	24 x 4.03	7 x 2.69	24.19	1112.0	0.09063	93.0
Squab/AW	305.83	49.81	26 x 3.87	7 x 3.01	24.51	1177.0	0.08976	105.0
Wood Duck/AW	307.06	71.65	30 x 3.61	7 x 3.61	25.27	1323.0	0.08761	126.0
Teal/AW	307.06	69.62	30 x 3.61	19 x 2.16	25.24	1314.0	0.08780	127.0
Kingbird/AW	323.01	17.95	18 x 4.78	1 x 4.78	23.90	1006.0	0.08760	67.0

Cont. 3.4.1

ASTM B 549

Code Name	Nominal Cross section Area		Conductor construction		Approx. overall diameter	Approx. overall weight	Calculated DC Resistance at 20 °C	Calculated breaking load
	Aluminium	Steel	Aluminium	Steel				
	mm ²		No. x Dia. (mm)		mm	kg / km	Ω / km	KN
Swift/AW	323.02	8.97	36 x 3.38	1 x 3.38	23.66	946.0	0.08842	61.0
Rook/AW	323.07	41.88	24 x 4.14	7 x 2.76	24.84	1168.0	0.08589	98.0
Grosbeak/AW	321.84	52.49	26 x 3.97	7 x 3.09	25.15	1238.0	0.08528	110.0
Scoter/AW	322.56	75.26	30 x 3.70	7 x 3.70	25.90	1391.0	0.08340	130.0
Egret/AW	322.56	73.54	30 x 3.70	19 x 2.22	25.90	1381.0	0.08355	133.0
Flamingo/AW	337.27	43.72	24 x 4.23	7 x 2.82	25.38	1225.0	0.08227	103.0
Gannet/AW	338.26	54.90	26 x 4.07	7 x 3.16	25.76	1298.0	0.08117	116.0
Stilt/AW	363.27	46.88	24 x 4.39	7 x 2.92	26.32	1314.0	0.07640	110.0
Starling/AW	361.93	59.15	26 x 4.21	7 x 3.28	26.68	1393.0	0.07583	122.0
Redwing/AW	362.06	82.41	30 x 3.92	19 x 2.35	27.43	1552.0	0.07444	149.0
Coot/AW	401.86	11.16	36 x 3.77	1 x 3.77	26.39	1183.0	0.07107	74.0
Cuckoo/AW	402.33	52.15	24 x 4.62	7 x 3.08	27.74	1460.0	0.06897	122.0
Drake/AW	402.56	65.44	26 x 4.44	7 x 3.45	28.11	1549.0	0.06820	136.0
Tern/AW	403.77	27.83	45 x 3.38	7 x 2.25	27.03	1298.0	0.07011	96.0
Condor/AW	402.33	52.15	54 x 3.08	7 x 3.08	27.72	1458.0	0.06897	124.0
Mallard/AW	403.84	91.78	30 x 4.14	19 x 2.48	28.96	1726.0	0.06675	165.0
Ruddy/AW	455.50	31.67	45 x 3.59	7 x 2.40	28.73	1470.0	0.06213	107.0
Canary/AW	456.28	59.15	54 x 3.28	7 x 3.28	29.52	1653.0	0.06081	138.0
Catbird/AW	484.61	13.46	36 x 4.14	1 x 4.14	28.98	1420.0	0.05894	87.0
Rail/AW	483.84	33.54	45 x 3.70	7 x 2.47	29.61	1558.0	0.05850	113.0
Cardinal/AW	484.53	62.81	54 x 3.38	7 x 3.38	30.42	1752.0	0.05727	146.0
Tanager/AW	522.79	14.52	36 x 4.30	1 x 4.30	30.12	1537.0	0.05463	94.0
Ortolan/AW	523.87	36.31	45 x 3.85	7 x 2.57	30.81	1688.0	0.05403	121.0
Curlew/AW	522.51	67.73	54 x 3.51	7 x 3.51	31.62	1896.0	0.05310	158.0
Bluejay/AW	565.49	38.90	45 x 4.00	7 x 2.66	31.98	1819.0	0.05006	130.0
Finch/AW	565.03	71.57	54 x 3.65	19 x 2.19	32.85	2043.0	0.04939	167.0
Bunting/AW	605.76	41.88	45 x 4.14	7 x 2.76	33.12	1948.0	0.04673	139.0
Grackle/AW	602.79	76.89	54 x 3.77	19 x 2.27	33.97	2188.0	0.04628	179.0
Skylark/AW	646.02	17.95	36 x 4.78	1 x 4.78	33.46	1893.0	0.04421	114.0
Bittern/AW	644.40	44.66	45 x 4.27	7 x 2.85	34.16	2078.0	0.04392	149.0
Pheasant/AW	645.08	81.71	54 x 3.90	19 x 2.34	35.10	2333.0	0.04326	189.0
Dipper/AW	684.24	47.20	45 x 4.40	7 x 2.93	35.19	2207.0	0.04137	158.0
Martin/AW	685.39	86.67	54 x 4.02	19 x 2.41	36.17	2478.0	0.04072	201.0
Bobolink/AW	725.27	50.14	45 x 4.53	7 x 3.02	36.24	2336.0	0.03903	167.0
Plover/AW	726.92	91.78	54 x 4.14	19 x 2.48	37.24	2625.0	0.03840	212.0
Nuthatch/AW	764.20	52.83	45 x 4.65	7 x 3.10	37.20	2467.0	0.03704	177.0
Parrot/AW	766.06	97.03	54 x 4.25	19 x 2.55	38.25	2768.0	0.03643	224.0
Lapwing/AW	807.53	55.60	45 x 4.78	7 x 3.18	38.20	2598.0	0.03506	186.0
Falcon/AW	806.23	102.43	54 x 4.36	19 x 2.62	39.26	2917.0	0.03461	236.0
Chukar/AW	903.18	73.54	84 x 3.70	19 x 2.22	40.70	2996.0	0.03136	220.0
Bluebird/AW	1092.84	88.84	84 x 4.07	19 x 2.44	44.76	3627.0	0.02592	262.0
Kiwi/AW	1099.76	47.52	72 x 4.41	7 x 2.94	44.10	3366.0	0.02609	218.0
Thrasher/AW	1171.42	63.94	76 x 4.43	19 x 2.07	45.79	3679.0	0.02440	246.0



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