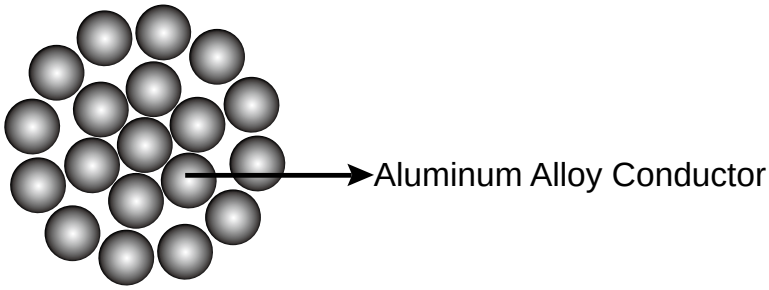
All Aluminum Alloy Conductor (AAAC) Cables



APPLICATION

AAAC is mainly used as bare overhead transmission cable and as primary and secondary distribution cable. It is also suitable for laying across basins, rivers and valleys where special geographical teatures exist.

STANDARD

Basic design to BS 3242 / BS EN 50182 / IEC 61089 / ASTM B 399/B 399M / DIN 48201 -6 standards

CONSTRUCTION

AAAC cable bvconsists of aluminum alloy wires. The aluminum alloy wires are concentrically stranded.

This section deals with heat-treatable magnesium silicon type aluminium alloys to the applicable International Standard, the electrical and mechanical properties of which all fall within the values suggested by relevant standard. Conductors to all other recognized specifications can also be supplied. The alloys referred to have higher strength but lower conductivity than pure aluminium. Being lighter, alloy conductors can sometimes be used to advantage in place of the more conventional ACSR; Having lower breaking loads than the later, their use becomes particularly favourable when ice and wind loadings are low.

ELECTRICAL PROPERTIES

Density@20ºC	2.70 kg/dm
Temperature Coefficient@20°C	0.00360 (°C)
Resistivity@20°C	0.0326 Ohms mm^2/m

Linear Expansivity	23 x10^{-6} (°C)

SERVICE CONDITIONS

Ambient Temperature	-5°C - 50°C
Wind Pressure	80 – 130kg/m^2
Seismic Acceleration	0.12 - 0.05g
Isokeraunic Level	10 – 18
Relative Humidity	5 – 100%

CONSTRUCTION PARAMETERS

- **BS 3242**

Code	AL Nominal Area	Cu Nominal Area Equivalent	Total Area	Stranding	Overall Diameter	Weight
	mm^2	mm^2	mm^2	No.×mm	mm	kg/km
-	-	6.45	11.7	7/1.47	4.41	32.2
Box	-	9.68	18.8	7/1.85	5.55	51.7
Acacia	-	12.9	21.9	7/2.08	6.24	66.1
Almond	25	16.1	30.1	7/2.34	7.02	82.9
Ceda	30	19.4	35.5	7/2.54	7.62	97.8
-	40	22.6	42.2	7/2.77	8.31	116.4
Fir	50	25.8	47.8	7/2.95	8.85	131.8
Hazel	100	32.3	59.9	7/3.30	9.9	165
Pine	-	38. 7	71.7	7/3.61	10.83	197.7
-	-	45.2	84.1	7/3.91	11.73	231.6
Willow	150	48.4	89.8	7/4.04	12.12	247.5
-	175	51.6	96.5	7/4.19	12.57	266.2
-	300	58.1	108.8	7/4.45	13.35	299.8
Oak	-	64.5	118.9	7/4.65	13.95	327.8

Code	AL Nominal Area	Cu Nominal Area Equivalent	Total Area	Stranding	Overall Diameter	Weight
	mm^2	mm^2	mm^2	No.×mm	mm	kg/km
-	-	80.6	118.8	19/2.82	14.1	327.6
Mulberry	-	96.8	151.1	19/3.18	15.9	416.7
Ash	-	113	180.7	19/3.48	17.4	498.1
Elm	-	129	211	19/3.76	18.8	582.1
Poplar	-	145	239	37/2.87	20.09	658.8
-	-	161	270.8	37/3.05	21.35	746.7
Sycamore	-	194	303	37/3.23	22.61	834.9
Upas	-	226	362.1	37/3.53	24.71	998.6
-	-	258	421.8	37/3.81	26.47	1163
Yew	-	-	479.9	37/4.06	28.42	1323

(*) Note: The values of current rating mentioned in above Table are based on wind velocity of 0.6 metre/second, solar heat radiation of 1200 watt/metre2, ambient temperature of 50° C & conductor temperature of 80°C.

- **BS EN 50182**

Code	Stranding	Nominal Area	Overall Diameter	Weight	Rated Strength	Electrical Resistance	Current Rating*
	No.×mm	mm^2	mm	kg/km	KN	Ω/Km	A
Box	7/1.85	18.8	5.55	51.4	5.55	1.748	87
Acacia	7/2.08	23.8	6.24	64.9	7.02	1.3828	101
Almond	7/2.34	30.1	7.02	82.2	8.88	1.0926	116
Cedar	7/2.54	35.5	7.62	96.8	10.46	0.9273	129
Deodar	7/2.77	42.2	8.31	115.2	12.44	0.7797	143
Fir	7/2.95	47.8	8.85	130.6	14.11	0.6875	155
Hazel	7/3.30	59.9	9.9	163.4	17.66	0.5494	178
Pine	7/3.61	71.6	10.83	195.6	21.14	0.4591	199
Holly	7/3.91	84.1	11.73	229.5	24.79	0.3913	219
Willow	7/4.04	89.7	12.12	245	26.47	0.3665	228

Code	Stranding	Nominal Area	Overall Diameter	Weight	Rated Strength	Electrical Resistance	Current Rating*
	No.×mm	mm^2	mm	kg/km	KN	Ω/Km	A
Oak	7/4.65	118.9	13.95	324.5	35.07	0.2767	272
Mulberry	19/3.18	150.9	15.9	414.3	44.52	0.2192	314
Ash	19/3.48	180.7	17.4	496.1	53.31	0.183	351
Elm	19/3.76	211	18.8	579.2	62.24	0.1568	386
Poplar	37/2.87	239.4	20.09	659.4	70.61	0.1387	416
Sycamore	37/3.23	303.2	22.61	835.2	89.4	0.1095	480
Upas	37/3.53	362.1	24.71	997.5	106.82	0.0917	535
Yew	37/4.06	479	28.42	1319.6	141.31	0.0693	633
Totara	37/4.14	498.1	28.98	1372.1	146.93	0.0666	648
Rubus	61/3.50	586.9	31.5	1622	173.13	0.0567	714
Sorbus	61/3.71	659.4	33.39	1822.5	194.53	0.0505	764
Araucaria	61/4.14	821.1	37.26	2269.4	242.24	0.0406	868
Redwood	61/4.56	996.2	41.04	2753.2	293.88	0.0334	970

(*) Note: The values of current rating mentioned in above Table are based on wind velocity of 0.6 metre/second, solar heat radiation of 1200 watt/metre2, ambient temperature of 50° C & conductor temperature of 80°C.

• IEC 60189

Code	Nominal Area	Stranding	Overall Diameter	Weight	Rated Strength	Electrical Resistance	Current Rating*
	mm^2	No.×mm	mm	kg/km	KN	Ω/Km	A
16	18.4	18.4	5.49	50.4	5.43	1.7896	86
25	28.8	28.8	6.87	78.7	8.49	1.1453	113
40	46	46	8.67	125.9	13.58	0.7158	151
63	72.5	72.5	10.89	198.3	21.39	0.4545	200
100	115	115	13.9	316.3	33.95	0.2877	266
125	144	144	15.5	395.4	42.44	0.2302	305
160	184	184	17.55	506.1	54.32	0.1798	355

Code	Nominal Area	Stranding	Overall Diameter	Weight	Rated Strength	Electrical Resistance	Current Rating*
	mm^2	No.×mm	mm	kg/km	KN	Ω/Km	A
200	230	230	19. 65	632.7	67.91	0.1439	407
250	288	288	21.95	790.8	84.88	0.1151	466
315	363	363	24.71	998.9	106.95	0.0916	535
400	460	460	27.86	1268.4	135.81	0.0721	618
450	518	518	29.54	1426.9	152.79	0.0641	663
500	575	575	31.15	1585.5	169.76	0.0577	706
560	645	645	33.03	1778.4	190.14	0.0516	755
630	725	725	35.01	2000.7	213.9	0.0458	809
710	817	817	37.17	2254.8	241.07	0.0407	866
800	921	921	39.42	2540.6	271.62	0.0361	928
900*	1036	1036	41.91	2861.1	305.58	0.0321	992
1000*	1151	1151	44.11	3179	339.53	0.0289	1051
1120*	1289	1289	46.75	3560.5	380.27	0.0258	1118
1250*	1439	1439	49.39	3973.7	424.41	0.0231	1185

(*) Note: The values of current rating mentioned in above Table are based on wind velocity of 0.6 metre/second, solar heat radiation of 1200 watt/metre2, ambient temperature of 50° C & conductor temperature of 80°C.

• ASTM B 399/B 399M

Nominal Area		Stranding	Overall Diameter	Weight	Rated Strength	Electrical Resistance	Current Rating*
AWG&MCM	mm^2	No.×mm	mm	kg/km	KN	Ω/Km	A
6	13.2	7/1.55	4.65	36.2	4.18	2.5361	69
4	21.1	7/1.96	5.88	57.9	6.69	1.586	93
2	33.5	7/2.47	7.41	92	10.6	0.9987	123
0	53.5	7/3.12	9.36	146.8	17	0.62592	165
2/0	67.3	7/3.50	10.5	184.8	20.4	0.49738	190
3/0	84.9	7/3.93	11.79	233	25.7	0.3945	219

Nominal Area		Stranding	Overall Diameter	Weight	Rated Strength	Electrical Resistance	Current Rating*
AWG&MCM	mm^2	No.×mm	mm	kg/km	KN	Ω/Km	A
4/0	107	7/4.42	13.26	294.7	32.5	0.31188	253
250	126	19/2.91	14.55	346.7	38.8	0.26509	280
300	152	19/3.19	15.95	416.7	46.6	0.22059	313
350	178	19/3.45	17.25	487.3	52	0.1886	345
400	203	19/3.69	18.45	557.5	59.5	0.16486	375
450	228	19/3.91	19.55	626	66.8	0.14683	402
500	253	19/4.12	20.6	695	74.2	0.13224	429
550	279	37/3.10	21.7	766.2	83.9	0.11995	455
600	303	37/3.23	22.61	831.9	91	0.11049	478
650	330	37/3.37	23.59	905.5	94.9	0.1015	504
700	354	37/3.49	24.43	971.2	101	0.09464	525
750	381	37/3.62	25.34	1045	109	0.08796	549
800	404	37/3.73	26.11	1109	116	0.08285	569
900	456	37/3.96	27.72	1250	131	0.07351	612
1000	508	37/4.18	29.26	1393	146	0.06597	653
1250	631	61/3.63	32.67	1732	179	0.05306	743
1500	759	61/3.98	35.82	2082	215	0.04414	827
1750	886	61/4.30	38.7	2431	251	0.03781	904

(*) Note: The values of current rating mentioned in above Table are based on wind velocity of 0.6 metre/second, solar heat radiation of 1200 watt/metre2, ambient temperature of 50° C & conductor temperature of 80°C.

• DIN 48201 Part 6

Nominal Area		Stranding	Overall Diameter	Weight	Rated Strength	Electrical Resistance	Current Rating*
Nominal	Teorical						
mm^2	mm^2	No.×mm	mm	kg/km	KN	Ω/Km	A
16	15.89	7/1.70	5.1	43	4.44	2.0742	78
25	24.25	7/2.10	6.3	66	6.77	1.3593	102
35	34.36	7/2.50	7.5	94	9.6	0.9591	126
50	49.48	7/3.00	9	135	13.82	0.666	158
50	48.35	19/1.80	9	133	13.5	0.6849	156
70	65.81	19/2.10	10.5	181	18.38	0.5032	189
95	93.27	19/2.50	12.5	256	26.05	0.3551	234
120	116.99	19/2.80	14	322	32.68	0.2831	269
150	147.11	37/2.25	15.8	406	41.09	0.2256	309
185	181.62	37/2.50	17.5	500	50.73	0.1828	352
240	242.54	61/2.25	20.3	670	67.74	0.1371	420
300	299.43	61/2.50	22.5	827	83.63	0.111	477
400	400.14	61/2.89	26	1104	111.76	0.0831	568
500	499.83	61/3.23	29.1	1379	139.6	0.0665	649
625*	626.2	91/2.96	32.6	1732	174.9	0.0531	742
800*	802.09	91/3.35	36.9	2218	224.02	0.0415	857
1000*	999.71	91/3.74	41.1	2767	279.22	0.0333	971

* The items marked with "*" are not in our current product range and the details are for information only.
(*) Note: The values of current rating mentioned in above Table are based on wind velocity of 0.6 metre/second, solar heat radiation of 1200 watt/metre2, ambient temperature of 50° C & conductor temperature of 80°C.

TECHNICAL DATA

Code	AL Nominal Area	Maximum Resistance DC at 20º		Current Rating	
				Temperate	Tropical
	mm²	Ω / km	Ω / 1000ft	Amp	Amp
-	-	2.87	0.873	90	73
Box	-	1.79	0.544	121	98
Acacia	-	1.4	0.426	140	114
Almond	25	1.11	0.339	162	131
Ceda	30	0.944	0.288	180	145
-	40	0.794	0.242	200	162
Fir	50	0.7	0.213	217	175
Hazel	100	0.559	0.17	250	201
Pine	-	0. 467	0.142	279	224
-	-	0.398	0.121	309	247
Willow	150	0.373	0.114	322	258
-	175	0.347	0.106	337	270
-	300	0.308	0.0938	343	290
Oak	-	0.282	0.0859	384	307
-	-	0.282	0.086	385	307
Mulberry	-	0.222	0.0676	448	356
Ash	-	0.185	0.0565	501	398
Elm	-	0.159	0.048	553	438
Poplar	-	0.14	0.0427	598	473
-	-	0.124	0.0337	647	511
Sycamore	-	0.111	0.0377	694	547
Upas	-	0.0925	0.0282	776	610
-	-	0.0794	0.0242	854	669
Yew	-	0.0698	0.0213	925	723