

POWERING INDUSTRY

OVERHEAD CONDUCTORS

ACSR/AAAC/AAC

Specifications: IEC61089 / EN50182



POWER BY INNOVATION... INNOVATION THROUGH PARTNERSHIPS

CBI-electric: african cables | a division of ATC (Pty) Ltd | Registration No, 1955/003773/07
PO Box 172, Vereeniging 1930 | Steel Road, Peacehaven, Vereeniging, 1939, South Africa
Tel: +27 16 430 6000 | www.cbi-electric.com | Member of the REUNERT Group | B-BBEE Level 1
ISO 9001 | ISO 14001 | ISO 4500

ACSR – Aluminium Conductor Steel Reinforced

- Aluminium strands around a steel core
- Steel provides high mechanical strength
- Used for long-distance transmission lines

Components

1. Steel Core
 - Galvanized steel wires
 - Provides mechanical strength
 - May consist of 1, 7, or 19 wires
2. Aluminium Strands
 - Hard drawn aluminium wires
 - Carry the electrical current
3. Stranding
 - Aluminium wires are helically wound around the steel core,



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Description: ACSR (Aluminum Conductor Steel Reinforced) A1/S1A

	Equal, copper	Strand (Al/Steel)	Diameter of Steel wire	Diameter of Aluminium wire	Overall diameter (Std.)	Aluminium area	Steel area	Total area	Aluminium mass	Steel mass	Total Mass	Ultimate tensile strength	Coefficient of linear expansion	Initial modulus of elasticity	Final modulus of elasticity	Resistance at 20°C	Current rating
	mm ²		mm	mm	mm	mm ²	mm ²	mm ²	Kg/km	Kg/km	Kg/km	Newton	C° x 10 ⁻⁶	MPa	MPa	Ω/km	A
MOLE	6,45	6/1	1,5	1,5	4,5	10,6	1,77	12,37	29,2	13,9	43,1	4780	19,31	65000	80400	2,7062	87
SQUIRREL	12,9	6/1	2,11	2,11	6,33	20,98	3,5	24,48	57,7	27,5	85,2	8020	19,31	54600	80400	1,3677	130
GOPHER	16,3	6/1	2,36	2,36	7,08	26,25	4,37	30,62	72,2	34,4	106,6	9610	19,31	52700	80400	1,0933	150
WEASEL	19,35	6/1	2,59	2,59	7,77	31,61	5,27	36,88	87	41,5	128,5	11450	19,31	51500	80400	0,9077	170
FOX	22,58	6/1	2,79	2,79	8,37	36,68	6,11	42,8	101	48,1	149,1	13100	19,31	50700	80400	0,7822	190
FERRET	25,81	6/1	3	3	9	42,41	7,07	49,48	117	55,6	172,6	15200	19,31	50200	80400	0,6766	210
RABBIT	32,26	6/1	3,35	3,35	10,05	52,88	8,81	61,7	145	69,4	214,4	18500	19,31	49500	80400	0,5426	240
MINK	38,71	6/1	3,66	3,66	10,98	63,13	10,52	73,65	174	82,8	256,8	21900	19,31	49100	80400	0,4546	260
SKUNK	38,71	12/7	2,59	2,59	12,95	63,22	36,88	100,1	175	292	467	52900	15,84	71900	108000	0,4571	270
BEAVER	45,16	6/1	3,99	3,99	11,97	75,02	12,5	87,53	206	98,4	304,4	25900	19,31	48800	80400	0,3825	290
HORSE	45,16	12/7	2,79	2,79	13,95	73,36	42,8	116,16	203	338	541	60700	15,84	71000	108000	0,3939	300
RACCOON	48,39	6/1	4,09	4,09	12,27	78,83	13,14	91,97	217	103	320	27200	19,31	48700	80400	0,364	300
OTTER	51,61	6/1	4,22	4,22	12,66	83,92	13,99	97,91	231	110	341	28900	19,31	48700	80400	0,3419	310
CAT	58,06	6/1	4,5	4,5	13,5	95,43	15,9	111,33	263	125	388	32800	19,31	48500	80400	0,3007	340
HARE	64,52	6/1	4,72	4,72	14,16	104,98	17,5	122,48	289	138	427	36000	19,31	48500	80400	0,2733	360
HYENA	64,52	7/7	1,93	4,39	14,57	105,8	20,44	126,2	290	160	450	41900	18,93	52400	82200	0,2712	360
DOG	64,52	6/1	4,72	4,71	14,15	104,98	13,55	118,53	289	100	389	34700	19,92	48800	76400	0,2733	360
HYENA	64,52	7/7	1,93	4,39	14,57	105,8	20,44	126,2	290	160	450	41900	18,93	52400	82200	0,2712	360
LEOPARD	80,65	26/7	1,75	5,28	15,81	131,3	16,8	148,1	360	132	492	42200	19,54	47800	76300	0,2184	410
CAYOTE	80,65	26/7	1,91	0,54	15,89	132,1	20,1	152,2	365	157	522	46400	19,54	51900	76000	0,3035	420
TIGER	80,65	30/7	2,36	2,36	16,52	131,23	30,62	161,85	364	242	524	58700	18,43	56900	83400	0,2202	420
WOLF	96,77	30/7	2,59	2,59	18,13	158,06	36,88	194,94	438	292	730	69200	18,43	55700	83400	0,1828	470
LYNX	112,9	30/7	2,79	2,79	19,53	183,41	42,8	226,2	508	330	846	79300	18,43	54900	83400	0,1576	520
IEC 315	205,6	45/7	1,99	2,99	23,91	315	21,8	337	853	170,8	1039	79030	21,11	57400	66700	0,0917	526
CHICADEE	122,567	6/1	3,77	3,77	18,87	200,93	11,16	212,09	555	87,9	643	44900	21,44	41000	66200	0,1427	530
PANTHER	129	30/7	3	3	21	212,06	49,48	261,54	588	391	970	90800	18,43	54300	83400	0,1363	560
LION	145,2	30/7	3,18	3,18	22,26	238,27	55,6	293,86	660	440	1100	101000	18,43	53900	83400	0,1213	610
BEAR	161,3	30/7	3,35	3,35	23,45	264,42	61,7	326,12	733	488	1220	112000	18,43	53600	83400	0,1093	650
IEC 450	294	45/7	2,38	3,57	28,56	450	31,1	481	1216	244,4	1461	107470	21,11	57400	66700	0,0642	651

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	Equal, copper	Strand (Al/Steel)	Diameter of Steel wire	Diameter of Aluminium wire	Overall diameter (Std.)	Aluminium area	Steel area	Total area	Aluminium mass	Steel mass	Total Mass	Ultimate tensile strength	Coefficient of linear expansion	Initial modulus of elasticity	Final modulus of elasticity	Resistance at 20°C	Current rating
	mm ²		mm	mm	mm	mm ²	mm ²	mm ²	Kg/km	Kg/km	Kg/km	Newton	C° x 10 ⁻⁶	MPa	MPa	Ω/km	A
IEC 500	326,6	45/7	2,51	3,76	30,09	500	34,6	535	1349	271,9	1621	119410	21,11	57400	66700	0,0578	693
KINGBIRD	197,04	6/1	4,78	4,78	23,9	323,01	17,95	340,96	142	896	1038	71320	21,69	41000	66200	0,0891	710
GOAT	193,5	30/7	3,71	3,71	25,97	324,31	75,67	399,98	899	598	1500	136000	18,43	53100	83400	0,0891	730
IEC 560	365,8	45/7	2,65	3,98	31,83	560	38,7	599	1511,6	303,1	1814,7	133740	21,11	57400	66600	0,0516	741
ANTILOPE	225,8	54/7	2,97	2,97	26,73	374,11	48,5	422,6	1040	383	1420	117000	19,91	47700	73200	0,0773	790
IEC 630	411,3	45/7	2,81	4,22	33,75	630	43,6	674	1699,38	340,7	2040,15	150455	21,11	14320	66700	0,0459	794
SHEEP	225,8	30/7	3,99	3,99	27,93	375,11	87,53	462,63	1040	692	1730	157000	18,43	52900	83400	0,077	800
BISON	225,8	54/7	3	3	27	381,7	49,48	431,18	1060	391	1450	119000	19,91	47600	73200	0,0757	800
TERN	253,4	45/7	2,25	3,7	27	403,77	27,83	431,6	220	1120	1340	98700	21,12	42900	66600	0,0718	830
ZEBRA	258,1	54/7	3,18	3,18	28,62	428,88	55,6	484,48	1190	440	1630	133000	19,91	47300	73200	0,0674	860
DEER	258,1	30/7	4,27	4,27	29,89	429,6	100,24	529,84	1190	792	1980	179000	18,43	52800	83400	0,0673	870
RAIL	304	45/7	2,47	3,7	29,59	483,84	33,54	517,39	265	1340	1610	117000	21,11	42400	66700	0,0598	920
ELK	290,3	54/7	3,35	3,35	30,15	475,96	61,7	537,66	1320	488	1810	147000	19,91	47000	73200	0,0606	930
MOOSE	322,6	54/7	3,53	3,53	31,77	528,49	68,51	596,99	1460	542	2000	162000	19,91	46700	73200	0,0547	980
DINOSAUR	414,63	54/19	2,36	3,95	35,5	661,73	83,11	744,84	1835	658	2493	202920	19,91	46700	72200	0,0437	1110

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AAAC – ALL ALUMINIUM ALOY CONDUCTOR

The conductor in AAAC is made of aluminium alloy,

- Aluminium alloy wires carry the electrical current,
- The alloy makes the aluminium stronger than pure aluminium,
- It has good resistance to corrosion,
- Used in overhead power lines

1. Aluminium Alloy Strands

- Made from aluminium alloy
- Stronger than pure aluminium
- Carry the electrical current

2. Stranding

- The wires are helically twisted together
- This improves flexibility and strength

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Description: AAAC (ALL ALUMINIUM ALOY CONDUCTOR) A2

Specification: IEC61089 / EN50182

	Equal, copper	Wire number and Size	No of Aluminium Alloy wires	Diameter of Al Alloy wire	Overall diameter (Std.)	Aluminium Alloy area	Total area	Aluminium Mass	Total Mass	Ultimate tensile strength	Coefficient of linear expansion	Initial modulus of elasticity	Final modulus of elasticity	Resistance at 20°C	Current rating
	mm ²			mm	mm	mm ²	mm ²	Kg/km	Kg/km	Newton	C° x 10 ⁻⁶	MPa	Mpa	Ω/km	A
ACACIA	13	7/2,08	7	2,08	6,24	23,79	23,79	65	65	6690	23	52500	61000	1,39	133
ALMOND	16	7/2,34	7	2,34	7,02	30,1	30,1	82	82	8440	23	52400	61000	1,1	153
CADAR	19	7/2,54	7	2,54	7,59	35,47	35,47	97	97	9960	23	52400	61000	0,934	169
IEC 35	22	7/2,77	7	2,77	8,31	42,18	42,18	115	115	11860	23	52400	61000	0,785	189
FIR	25	7/2,95	7	2,95	8,85	47,84	47,84	131	131	13430	23	52400	61000	692	204
HAZEL	32	7/3,30	7	3,3	9,9	59,87	59,87	164	164	16820	23	52400	61000	0,553	235
PINE	38	7/3,61	7	3,61	10,83	71,65	71,65	196	196	20200	23	52400	61000	0,462	262
IEC 70	45	7/3,91	7	3,91	11,73	84,05	84,05	230	230	23630	23	52400	61000	0,394	290
WILLOW	48	7/4,04	7	4,04	12,12	89,73	89,73	245	245	25200	23	52400	61000	0,369	302
IEC 80	51	7/4,19	7	4,19	12,57	96,52	96,52	264	264	27060	23	52400	61000	0,343	316
IEC 90	58	7/4,45	7	4,45	13,35	108,9	108,9	298	298	30400	23	52400	61000	0,306	339
ORK	63	7/4,65	7	4,65	13,95	118,9	118,9	325	325	33330	23	52400	61000	0,279	359
MULBERRY	80	19/3,18	19	3,18	15,9	150,9	150,9	415	415	42350	23	49650	59650	0,221	416
ASH	96	19/3,48	19	3,48	17,4	180,7	180,7	497	497	50690	23	49650	59650	0,184	467
ELM	112	19/3,76	19	3,76	18,8	210,9	210,9	580	580	59220	23	49650	59650	0,158	513
POPLAR	119	37/2,87	19	2,87	20,09	239,4	239,4	660	660	67350	23	48250	58600	0,139	551
IEC 225	143	37/3,05	19	3,05	21,35	270,3	270,3	744	744	75780	23	48250	58600	0,123	600
SYCAMORE	161	37/3,23	19	3,23	22,61	303,2	303,2	835	835	85000	23	48250	58600	0,11	643
UPAS	192	37/3,53	19	3,53	24,71	362,1	362,1	997	997	101670	23	48250	58600	0,0921	718

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AAAC (ALL ALUMINIUM ALOY CONDUCTOR) A2

	Equival, copper	Wire number and Size	No of Aluminium Alloy wires	Diameter of Al Alloy wire	Overall diameter (Std.)	Aluminium Alloy area	Total area	Aluminium Mass	Total Mass	Ultimate tensile strength	Coefficient of linear expansion	Initial modulus of elasticity	Final modulus of elasticity	Resistance at 20°C	Current rating
	mm ²			mm	mm	mm ²	mm ²	Kg/km	Kg/km	Newton	C° x 10 ⁻⁶	MPa	Mpa	Ω/km	A
IEC 350	224	37/3,81	19	3,81	26,67	421,8	421,8	1162	1162	118430	23	48250	58600	0,0791	789
YEW	254	37/4,06	19	4,06	28,42	479	479	1319	1319	134510	23	48250	58600	0,0696	853
IEC 350	224	37/3,81	19	3,81	26,67	421,8	421,8	1162	1162	118430	23	48250	58600	0,0791	789
YEW	254	37/4,06	19	4,06	28,42	479	479	1319	1319	134510	23	48250	58600	0,0696	853
IEC 400	239	37/3,98	37	3,98	27,9	460	460	1268,4	1268,4	135810	23	48250	58600	0,0721	829
IEC 450	269	37/4,22	37	4,22	29,6	518	518	1426,9	1426,9	152790	23	48250	58600	0,0641	987
IEC 500	297	37/4,45	37	4,45	31,2	575	517	1558,5	1558,5	169760	23	48250	58600	0,0577	1145
IEC 560	335	61/3,67	61	3,67	33	645	645	1778,4	1778,4	190140	23	46200	57570	0,0516	1303
IEC 630	377	61/3,89	61	3,89	35	725	725	2000,7	2000,7	213900	23	46200	57570	0,0458	1461
IEC 710	424	61/4,13	61	4,13	37,2	817	817	2254,8	2254,8	241070	23	46200	57570	0,0407	1619
IEC 800	416	61/4,38	61	4,38	39,5	921	921	2540,6	2540,6	27620	23	46200	57570	0,0361	1777

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Conductor AAC – ALL ALUMINIUM CONDUCTOR

The conductor in AAC is made of 100% aluminium strands,

- Aluminium wires carry the electrical current,
- Aluminium is lightweight and a good conductor of electricity,
- AAC has high electrical conductivity,

1. Aluminium Strands

- Made from hard-drawn aluminium wires,
- These wires carry the electrical current,
- They are twisted together to form the conductor,

2. Stranding

- The aluminium wires are helically wound (twisted) together in layers,
- Stranding improves:
 - Flexibility
 - Strength of the conductor

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AAC (ALL ALUMINIUM CONDUCTOR) A1

Description: AAC (ALL ALUMINIUM CONDUCTOR) A1

Specification: IEC61089 / EN50182

	Equal, copper	Wire number and Size	No of Al/Al Alloy wires	Diameter of Al wire	Overall diameter (Std.)	Aluminium area	Aluminium Mass	Ultimate tensile strength	Coefficient of linear expansion	Initial modulus of elasticity	Final modulus of elasticity	Resistance at 20°C	Current rating
	mm ²			mm	mm ²	mm ²	Kg/km	Newton	C° x 10 ⁻⁶	MPa	Mpa	Ω/km	A
MIDGE	14,19	7/2,06	7	2,06	6,18	23,33	64	4340	23	52400	61000	1,2271	139
APHIS	16,13	3/3,35	3	3,35	7,24	26,44	72,7	4340	23	50000	69000	1,081	154
GNAT	16,13	7/2,21	7	2,21	6,63	26,85	73,7	4860	23	52400	61000	1,0662	152
WEEVIL	19,35	3/3,66	3	3,66	7,91	31,56	86,8	5130	23	60000	69000	0,9078	172
MOSQUITO	22,58	7/2,59	7	2,59	7,77	36,88	101	6360	23	52400	61000	0,7763	185
LADYBIRD	25,81	7/2,79	7	2,79	8,37	42,8	117	7250	23	52400	61000	0,669	203
ANT	32,26	7/3,10	7	3,1	9,3	52,83	145	8770	23	52400	61000	0,5419	231
FLY	38,71	7/3,40	7	3,4	10,2	65,55	174	10400	23	52400	61000	0,4505	259
BLUEBOTTLE	45,16	7/3,66	7	3,66	10,98	73,65	202	12000	23	52400	61000	0,3887	284
EARWIG	48,39	7/3,78	7	3,78	11,34	78,55	216	12700	23	52400	61000	0,3644	296
GRASSHOPPER	51,61	7/3,91	7	3,91	11,73	84,05	231	13600	23	52400	61000	0,3406	308
CLEGG	58,06	7/4,17	7	4,17	12,51	95,6	262	15400	23	52400	61000	0,2995	334
WASP	64,52	7/4,39	7	4,39	13,17	105,95	291	17000	23	52400	61000	0,2702	356
BEETLE	64,52	19/2,67	19	2,67	13,35	106,38	293	18200	23	49350	59650	0,2704	358
BEE	80,64	7/4,90	7	4,9	14,7	132	362	21000	23	49650	61000	0,2169	408
CRICKET	96,77	7/5,36	7	5,36	16,08	157,95	434	25100	23	49650	61000	0,1813	456
HORNET	96,77	19/3,25	19	3,25	16,25	157,95	435	26000	23	49650	59650	0,1825	457
CATERPILLAR	112,9	19/3,53	19	3,53	17,65	185,95	513	30300	23	49650	59650	0,1825	457
CHAFER	129	19/3,98	19	3,98	18,9	213,22	588	34500	23	49650	59650	0,1349	551
SPIDER	145,2	19/3,99	19	3,99	19,95	237,57	655	38300	23	49650	59650	0,1211	589

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AAC (ALL ALUMINIUM CONDUCTOR) A1

	Equival, copper	Wire number and Size	No of Al/Al Alloy wires	Diameter of Al wire	Overall diameter (Std.)	Aluminium area	Aluminium Mass	Ultimate tensile strength	Coefficient of linear expansion	Initial modulus of elasticity	Final modulus of elasticity	Resistance at 20°C	Current rating
	mm ²			mm	mm ²	mm ²	Kg/km	Newton	C° x 10 ⁻⁶	MPa	Mpa	Ω/km	A
COCKROACH	161,3	19/4,22	19	4,22	21,1	265,75	733	42700	23	49650	59650	0,1083	632
BUTTERFLY	193,5	19/4,65	19	4,65	23,25	322,66	890	51500	23	49650	58600	0,0892	713
MOTH	225,8	19/5,00	19	5	25	373,06	1030	59400	23	49650	59650	0,0771	779
DRONE	225,8	37/3,58	37	3,58	25,06	372,44	1030	60600	23	48250	58600	0,0774	779
LUCUST	258,1	19/3,36	19	3,36	26,8	428,72	1180	68200	23	49650	59650	0,0671	849
CENTIPED	258,1	37/3,78	37	3,78	26,46	415,22	1150	67200	23	48250	58600	0,0694	833
MAYBUG	290,3	37/4,09	37	4,09	28,63	486,11	1340	78200	23	48250	58600	0,0593	918
SCORPION	322,6	37/4,27	37	4,27	29,89	529,84	1460	85000	23	48250	58600	0,0544	967
CICADA	387,1	37/4,65	37	4,65	32,55	628,34	1740	100000	23	48250	58600	0,0459	1070
TARANTULA	483,9	37/5,23	37	5,23	36,61	794,87	2200	126000	23	48250	58600	0,0363	1230
BULL	527,87	61/4,25	61	4,25	38,25	865,36	2400	139000	23	46200	57570	0,0334	1300

POWER BY INNOVATION... INNOVATION THROUGH PARTNERSHIPS

Cbi-electric: african cables | a division of ATC (Pty) Ltd | Registration No, 1955/003773/07
 PO Box 172, Vereeniging 1930 | Steel Road, Peacehaven, Vereeniging, 1939, South Africa
 Tel: +27 16 430 6000 | www.cbi-electric.com | Member of the REUNERT Group | B-BBEE Level 1
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