

APPLICATION

Conductor for aerial power lines of medium, high and extra high voltage.

CONSTRUCTION CHARACTERISTICS

Conductors are formed by aluminium alloy wires, concentrically stranded in layers.

All wires have the same nominal diameter.

AAAC – "All Aluminium Alloy Conductors"

GENERAL CHARACTERISTICS

The aluminium alloy has a tensile strength capacity higher than AL1 aluminium

Aluminium alloy with a conductivity between 52,5 and 53% IACS

The ratio tensile/weight is higher than standard AAC cables

The resistance to corrosion exceeds that of ACSR cables

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

CENELEC EN50182:2001 standard

Characteristics of aluminium alloy conductors – Type AL 3 – Spain

Code	Old code	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)
28-AL3	D 28	27,8	7	2,25	6,75	76,0	8,21	1,1817
43-AL3	D 40	43,1	7	2,80	8,40	117,7	12,72	0,7631
55-AL3	D 56	54,6	7	3,15	9,45	148,9	16,096	0,6029
76-AL3	D 80	75,5	19	2,25	11,3	207,4	22,29	0,4378
117-AL3	D 110	117,0	19	2,80	14,0	321,2	34,51	0,2827
148-AL3	D 145	148,1	19	3,15	15,8	406,5	43,68	0,2234
188-AL3	D 180	188,1	19	3,55	17,8	516,3	55,48	0,1759
279-AL3	D 280	279,3	37	3,10	21,7	769,3	82,38	0,1188
381-AL3	D 400	381,0	61	2,82	25,4	1 053,0	112,39	0,0874
454-AL3	D 450	454,5	61	3,08	27,7	1 256,1	134,07	0,0733
547-AL3	D 550	547,3	61	3,38	30,4	1 512,7	161,46	0,0608
638-AL3	D 630	638,3	61	3,65	32,9	1 764,0	188,29	0,0522

Note 1 – Outer layer stranding direction: Right-hand (Z).



CENELEC EN50182:2001 standard

Characteristics of aluminium alloy conductors – Type AL 3 – United Kingdom

Code number	Previous code word	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)
24-AL3	ACACIA	23,8	7	2,08	6,24	64,9	7,02	1,3828
30-AL3	ALMOND	30,1	7	2,34	7,02	82,2	8,88	1,0926
35-AL3	CEDAR	35,5	7	2,54	7,62	96,8	10,46	0,9273
42-AL3	DEODAR	42,2	7	2,77	8,31	115,2	12,44	0,7797
48-AL3	FIR	47,8	7	2,95	8,85	130,6	14,11	0,6875
60-AL3	HAZEL	59,9	7	3,30	9,90	163,4	17,66	0,5494
72-AL3	PINE	71,6	7	3,61	10,8	195,6	21,14	0,4591
84-AL3	HOLLY	84,1	7	3,91	11,7	229,5	24,79	0,3913
90-AL3	WILLOW	89,7	7	4,04	12,1	245,0	26,47	0,3665
119-AL3	OAK	118,9	7	4,65	14,0	324,5	35,07	0,2767
151-AL3	MULBERRY	150,9	19	3,18	15,9	414,3	44,52	0,2192
181-AL3	ASH	180,7	19	3,48	17,4	496,1	53,31	0,1830
211-AL3	ELM	211,0	19	3,76	18,8	579,2	62,24	0,1568
239-AL3	POPLAR	239,4	37	2,87	20,1	659,4	70,61	0,1387
303-AL3	SYCAMORE	303,2	37	3,23	22,6	835,2	89,40	0,1095
362-AL3	UPAS	362,1	37	3,53	24,7	997,5	106,82	0,0917
479-AL3	YEW	479,0	37	4,06	28,4	1 319,6	141,31	0,0693
498-AL3	TOTARA	498,1	37	4,14	29,0	1 372,1	146,93	0,0666
587-AL3	RUBUS	586,9	61	3,50	31,5	1 622,0	173,13	0,0567
659-AL3	SORBUS	659,4	61	3,71	33,4	1 822,5	194,53	0,0505
821-AL3	ARAUCARIA	821,1	61	4,14	37,3	2 269,4	242,24	0,0406
996-AL3	REDWOOD	996,2	61	4,56	41,0	2 753,2	293,88	0,0334

Note 1 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN50182:2001 standard

Characteristics of aluminium alloy conductors features – Type AL 3 – Germany

Code	Old code	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (Kg/km)	Rated strength (kN)	Electrical resist. c.c 20°C (Ω/km)	Final modulus of elasticity (N/mm ²)	Final coefficient of linear expansion (1/K)	Current carrying capacity A (1)
16-AL3	16	15,9	7	1,70	5,10	43,4	4,69	2,0701	60 000	2,30E-05	105
24-AL3	25	24,2	7	2,10	6,30	66,2	7,15	1,3566	60 000	2,30E-05	135
34-AL3	35	34,4	7	2,50	7,50	93,8	10,14	0,9572	60 000	2,30E-05	170
49-AL3	50	49,5	7	3,00	9,00	135,1	14,60	0,6647	60 000	2,30E-05	210
48-AL3	50	48,3	19	1,80	9,00	132,7	14,26	0,6841	57 000	2,30E-05	210
66-AL3	70	65,8	19	2,10	10,5	180,7	19,41	0,5026	57 000	2,30E-05	255
93-AL3	95	93,3	19	2,50	12,5	256,0	27,51	0,3546	57 000	2,30E-05	320
117-AL3	120	117,0	19	2,80	14,0	321,2	34,51	0,2827	57 000	2,30E-05	365
147-AL3	150	147,1	37	2,25	15,8	405,3	43,40	0,2256	57 000	2,30E-05	425
182-AL3	185	181,6	37	2,50	17,5	500,3	53,58	0,1827	57 000	2,30E-05	490
243-AL3	240	242,5	61	2,25	20,3	670,3	71,55	0,1373	55 000	2,30E-05	585
299-AL3	300	299,4	61	2,50	22,5	827,5	88,33	0,1112	55 000	2,30E-05	670
400-AL3	400	400,1	61	2,89	26,0	1 105,9	118,04	0,0832	55 000	2,30E-05	810
500-AL3	500	499,8	61	3,23	29,1	1 381,4	147,45	0,0666	55 000	2,30E-05	930
626-AL3	625	626,2	91	2,96	32,6	1 737,7	184,73	0,0534	55 000	2,30E-05	1 075
802-AL3	800	802,1	91	3,35	36,9	2 225,8	236,62	0,0417	55 000	2,30E-05	1 255
1000-AL3	1 000	999,7	91	3,74	41,1	2 774,3	294,91	0,0334	55 000	2,30E-05	1 450

Note 1 – (1) Guideline values of current carrying capacity are valid up to a frequency of 60 Hz, assuming a wind velocity of 0,6 m/s, the effect of solar radiation for Germany, an initial ambient temperature of 35° C and a conductor temperature of 80° C. For special applications, when there is no air turbulence, the values should be reduced by 30 %.

Note 2 – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in Germany. Values for other conductor constructions may be calculated using the method given in IEC 61597.

Note 3 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN 50182 standard

Characteristics of aluminium alloy conductors – Type AL 4 – France

Code	Previous code	Conductor area	N.° of wires	Wire diameter	Nominal diameter	Linear mass	Rated strength	Electrical resist. d.c. 20°C	Final modulus of elasticity	Final coefficient of linear expansion
	ASTER	(mm ²)		(mm)	(mm)	(Kg/km)	(kN)	(Ω/km)	(N/mm ²)	(1/K)
22-AL4	22	22,0	7	2,00	6,00	60,0	7,15	1,4989	62 000	2,30E-05
34-AL4	34,4	34,4	7	2,50	7,50	93,8	11,17	0,9593	62 000	2,30E-05
55-AL4	54,6	54,6	7	3,15	9,45	148,9	17,73	0,6042	62 000	2,30E-05
76-AL4	75,5	75,5	19	2,25	11,3	207,4	24,55	0,4388	60 000	2,30E-05
117-AL4	117	117,0	19	2,80	14,0	321,2	38,02	0,2833	60 000	2,30E-05
148-AL4	148	148,1	19	3,15	15,8	406,5	48,12	0,2239	60 000	2,30E-05
182-AL4	181,6	181,6	37	2,50	17,5	500,3	59,03	0,1831	57 000	2,30E-05
228-AL4	228	227,8	37	2,80	19,6	627,6	74,04	0,1460	57 000	2,30E-05
288-AL4	288	288,3	37	3,15	22,1	794,3	93,71	0,1154	57 000	2,30E-05
366-AL4	366	366,2	37	3,55	24,9	1 008,9	115,36	0,0908	57 000	2,30E-05
570-AL4	570	570,2	61	3,45	31,1	1 576,0	185,33	0,0585	54 000	2,30E-05
851-AL4	851	850,7	91	3,45	38,0	2 360,7	276,47	0,0394	52 000	2,30E-05
1144-AL4	1 144	1 143,5	91	4,00	44,0	3 173,4	360,22	0,0293	52 000	2,30E-05
1596-AL4	1 600	1 595,9	127	4,00	52,0	4 427,5	502,72	0,0210	50 500	2,30E-05

Note 1 – Outer layer stranding direction: Left-hand (S).**Note 2** – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in France. Values for other conductor constructions may be calculated using the method given in IEC 61597.

ASTM B-399 standard

Characteristics of aluminium alloy conductors – Countries with North American influence

Code word	Conductor size (MCM)	Composition		Outer diam. (mm)	Conductor area (mm ²)	ACSR size of equivalent diameter	E.C. size of equivalent resistance	Linear mass (kg/km)	Rated strength (N)	Electrical resistance (Ω/km)			Current carrying capacity A (1)
		N.º	Ø (mm)							d.c. 20°C	a.c. 25°C	a.c. 75°C	
AKRON	30,58	7	1,68	5,04	15,52	6-6/1	6	42,7	4 920	2,1614	2,1995	2,5754	110
ALTON	48,69	7	2,12	6,36	24,70	4-6/1	4	68,0	7 840	1,3576	1,3816	1,6175	150
AMES	77,47	7	2,67	8,01	39,19	2-6/1	2	108,2	12 500	0,8533	0,8694	1,0171	200
AZUSA	123,3	7	3,37	10,11	62,44	1/0-6/1	1/0	172,2	19 000	0,5364	0,5456	0,6398	270
ANAHEIM	155,4	7	3,78	11,34	78,55	2/0-6/1	2/0	217,1	24 000	0,4255	0,4331	0,5072	315
AMHERST	195,7	7	4,25	12,75	99,30	3/0-6/1	3/0	273,4	30 200	0,3379	0,3445	0,4035	365
ALLIANCE	246,9	7	4,77	14,31	125,09	4/0-6/1	4/0	345,0	38 100	0,2658	0,2740	0,3199	420
BUTTE	312,8	19	3,26	16,30	158,59	266-26/7	266	436,9	46 700	0,2114	0,2156	0,2523	490
CANTON	394,5	19	3,66	18,30	199,89	336-26/7	336	551,1	59 000	0,1675	0,1713	0,2001	570
CAIRO	465,4	19	3,98	19,90	236,38	397-26/7	397	650,2	69 600	0,1421	0,1453	0,1698	640
DARIEN	559,5	19	4,36	21,80	283,67	477-26/7	477	781,6	83 600	0,1181	0,1211	0,1414	720
ELGIN	652,4	19	4,71	23,55	331,04	556-26/7	536	911,4	97 500	0,1013	0,1043	0,1217	790
FLINT	740,8	37	3,59	25,13	374,52	636-26/7	636	1 035	108 000	0,08924	0,09219	0,1073	860
GREELEY	927,2	37	4,02	28,14	469,62	795-26/7	795	1 295	136 000	0,07129	0,07415	0,08629	990

Note 1 – (1) With the following conditions:

Ambient temperature = 25°C;

Conductors' temperature = 75°C;

Wind velocity = 0,6 m/s. No full sun (Without solar radiation).

Note 2 – Outer layer stranding direction: Right-hand (Z).