

Aluminium Conductor Steel Reinforced (ACSR)



APPLICATION

ACSR conductor consists of a solid or stranded steel core surrounded by strands of aluminium. ACSR conductor is available in a range of steel strengths varying from 6% up to 40%. The higher strength ACSR conductors are used for river crossings, overhead earth wires, and installations involving extra-long spans. Against any given resistance of conductor, ACSR conductor may be manufactured to have different tensile strengths as per requirement. The principal advantage of these conductors are their high tensile strength and light weight, covering longer spans with less supports. Due to the greater diameter of an ACSR conductor much higher corona limit can be obtained, giving a big advantage on high and extra high voltage overhead lines.

STANDARDS

DIN 48201, BS 215, UNE 21.018



CONSTRUCTION Conductor

Hard Drawn Aluminium: BS EN 60889

AL1 and Zinc coated steel wire as per BS EN 50189 with the class and grade in accordance with ST1A, ST5E and ST6C



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Aluminium Conductor steel reinforce - ACSR (British Standard Sizes)

Code Name	Equivalent copper area mm ²	Stranding and wire diameter mm	Diameter over steel mm	Overall diameter mm (Std.)	Aluminium area mm ²	Steel area mm ²	Total area mm ²	Mass kg/km			Ultimate tensile strength newtons	Breaking load kg	Coefficient of linear expansion /C ⁰ x 10 ⁻⁶	Initial modulus of elasticity N/mm ²	Final modulus of elasticity N/mm ²	DC resistance at 20 ⁰ C ohms/km	Current rating Amps	Standard drum length m
								Aluminium	Steel	Total								
MOLE	6,45	6/1/1,50	1,50	4,50	10,60	1,77	12,37	29,20	13,90	43,10	4780	487	19,31	65000	80400	2,7062	87	3000
SQUIRREL	12,90	6/1/2,11	2,11	6,33	20,98	3,50	24,48	57,70	27,50	85,20	8020	818	19,31	54600	80400	1,3677	130	3000
GOPHER	16,30	6/1/2,36	2,36	7,08	26,25	4,37	30,62	72,20	34,40	107	9610	990	19,31	52700	80400	1,0933	150	3000
WEAVEL	19,35	6/1/2,59	2,59	7,77	31,61	5,27	36,88	87,00	41,50	129	11450	1160	19,31	51500	80400	0,9077	170	2500
FOX	22,58	6/1/2,79	2,79	8,37	36,68	6,11	42,80	101	48,10	149	13100	1340	19,31	50700	80400	0,7822	190	2500
FERRET	25,81	6/1/3,00	3,00	9,00	42,41	7,07	49,48	117	55,60	173	15200	1530	19,31	50200	80400	0,6766	210	1500
RABBIT	32,26	6/1/3,35	3,35	10,50	52,88	8,81	61,70	145	69,70	214	18500	1890	19,31	49500	80400	0,5426	240	1500
MINK	38,71	6/1/3,66	3,66	10,98	63,13	10,52	73,65	174	82,80	257	21900	2230	19,31	49100	80400	0,4546	260	1500
SKUNK	38,71	12/7/2,59	7,77	12,95	63,22	36,88	100,10	175	292	467	52900	5390	15,84	71900	108000	0,4571	270	2000
BEAVER	45,16	6/1/3,99	3,99	11,97	75,02	12,50	87,53	206	98,40	304	25900	2640	19,31	48800	80400	0,3825	290	1500
HORSE	45,16	12/7/2,79	8,37	13,95	7336	42,80	116,16	203	338	541	60700	6190	15,84	71000	108000	0,3939	300	2000
RACCOON	48,39	6/1/4,09	4,09	12,27	78,83	13,14	91,97	217	103	320	27200	2770	19,31	48700	80400	0,3640	300	1500
OTTER	51,61	6/1/4,22	4,22	12,66	83,92	13,99	97,91	231	110	341	28900	2950	19,31	48700	80400	0,3419	310	1500
CAT	58,06	6/1/4,50	4,50	13,50	95,43	15,90	111,33	263	125	388	32800	3340	19,31	48500	80400	0,3007	340	1500
HARE	64,52	6/1/4,72	4,72	14,16	104,98	17,50	122,48	289	138	427	36000	3670	19,31	48500	80400	0,2733	360	1500
DOG	64,52	6/4,72	4,71	14,15	104,98	12,70	117,69	289	100	389	34700	3540	19,92	48800	76400	0,2733	360	2000
		+7/1,57																
HYENA	64,52	7/4,39	5,79	14,57	105,95	20,48	126,43	291	162	453	41900	4270	18,93	52400	82200	0,2697	360	2000
		+7/1,93																
LEOPARD	80,65	6/5,28	5,25	15,81	131,37	16,84	148,21	361	133	494	42200	4300	19,54	47800	76300	0,2184	410	2000
		+7/1,75																
COYOTE	80,65	26/2,54	5,73	15,89	131,74	20,06	151,80	365	159	524	47300	4820	19,54	51900	76000	0,3035	420	2000
		+7/1,91																
TIGER	80,65	30/7/2,36	4,72	16,52	131,23	30,62	161,85	364	242	606	58700	5980	18,43	56900	83400	0,2202	420	2000
WOLF	96,77	30/7/2,59	7,77	18,13	158,06	36,88	194,94	438	292	730	69200	7050	18,43	55700	83400	0,1828	470	2000
LYNX	112,90	30/7/2,59	8,37	19,53	183,41	42,80	226,20	508	330	846	79300	8080	18,43	54900	83400	0,1576	520	2000
PANTHER	129,00	30/7/3,00	9,00	21,00	212,06	49,48	261,54	588	391	970	90800	9260	18,43	54300	83400	0,1363	560	2000
LION	145,20	30/7/3,18	9,54	22,26	238,27	55,60	293,86	660	440	1100	101000	10300	18,43	53900	83400	0,1213	610	2000
BEAR	161,30	30/7/3,35	10,05	23,45	264,42	61,70	326,12	733	488	1220	11200	11400	18,43	53600	83400	0,1093	650	2000
GOAT	193,50	30/7/3,71	11,13	25,97	324,31	75,67	399,98	899	598	1500	136000	13900	18,43	53100	83400	0,0891	730	2000
SHEEP	225,80	30/7/3,99	11,97	27,93	375,11	87,53	462,63	1040	692	1730	157000	16000	18,43	52900	83400	0,0770	800	2000
ANTELOPE	225,80	54/7/2,97	8,91	26,73	374,11	48,50	422,60	1040	383	1420	117000	11900	19,91	47700	73200	0,0773	790	2000
BISON	225,80	54/7/3,00	9,00	27,00	381,70	49,48	431,18	1060	391	1450	119000	12100	19,91	47600	73200	0,0757	800	2000
DEER	258,10	30/7/4,27	12,81	29,89	429,60	100,24	529,84	1190	792	1980	179000	18200	18,43	52800	83400	0,0673	870	2000
ZEBRA	258,10	54/7/3,18	9,54	28,62	428,88	55,60	484,48	1190	440	1630	133000	13600	19,91	47300	73200	0,0674	860	1500
ELK	290,30	30/7/4,50	13,50	31,50	477,13	111,33	588,46	1320	880	2200	199000	20300	18,43	52700	83400	0,0606	930	2000
CAMEL	290,30	57/7/3,35	10,05	30,15	475,96	61,70	537,66	1320	488	1810	147000	15000	19,91	47000	73200	0,0607	920	2000
MOOSE	322,60	54/7/3,53	10,59	31,77	528,49	68,51	596,99	1460	542	2000	162000	16500	19,91	46700	73200	0,0547	980	2000



DIN 48201

CODE	SECTION			STRANDING		OVERALL DIAMETER		RATED STRENGTH	ELECTRICAL RESISTANCE AT 20°C	CONDUCTOR WEIGHT			CURRENT CARRYING CAPACITY
	mm ²			No. x mm		mm				kg/km			
	Al	Steel	Total	Al	Steel	Core	Total			Al	Steel	Total	
16/2.5	15.3	2.55	17.85	6 x 1.80	1 x 1.80	1.8	5.4	5.95	1.8792	42	20	62	90
25/4	23.8	4	27.8	6 x 2.25	1 x 2.25	2.25	6.8	9.2	1.2027	66	31	97	125
35/6	34.3	5.7	40	6 x 2.70	1 x 2.70	2.7	8.1	12.65	0.8353	95	45	140	145
44/32	44	31.7	75.7	14 x 2.00	7 x 2.40	7.2	11.2	45	0.6566	124	248	372	160
50/8	48.3	8	56.3	6 x 3.20	1 x 3.20	3.2	9.6	17.1	0.5946	133	63	196	170
50/30	51.2	29.8	81	12 x 2.33	7 x 2.33	6.99	11.7	43.8	0.5644	143	235	378	170
70/12	69.9	11.4	81.3	26 x 1.85	7 x 1.44	4.32	11.7	26.8	0.413	194	90	284	290
95/15	94.4	15.3	109.7	26 x 2.15	7 x 1.67	5.01	13.6	35.75	0.3058	262	121	383	350
95/55	96.5	56.3	152.8	12 x 3.20	7 x 3.20	9.6	16	79.35	0.2992	269	443	712	350
105/75	105.7	75.5	181.5	14 x 3.10	19 x 2.25	11.25	17.5	108.45	0.2733	295	596	891	370
120/20	121.6	19.8	141.4	26 x 2.44	7 x 1.90	5.7	15.5	45.65	0.2374	338	156	494	410
120/70	122	71.3	193.3	12 x 3.60	7 x 3.60	10.8	18	100	0.2364	341	560	901	410
125/30	127.9	29.8	157.7	30 x 2.33	7 x 2.33	6.99	16.1	57.6	0.2259	356	235	591	425
150/25	148.9	24.2	173.1	26 x 2.70	7 x 2.10	6.31	17.1	55.25	0.1939	414	191	605	470
170/40	171.8	40.1	211.9	30 x 2.70	7 x 2.70	8.1	18.9	76.75	0.1682	479	315	794	520
185/30	183.8	29.8	213.6	26 x 3.00	7 x 2.33	6.99	19	66.2	0.1571	511	235	746	535
210/35	209.1	34.1	243.2	26 x 3.20	7 x 2.49	7.47	20.3	74.9	0.138	583	267	850	590
210/50	212.1	49.5	261.6	30 x 3.00	7 x 3.00	9	21	93.9	0.1363	593	388	981	610
230/30	230.9	29.8	260.7	24 x 3.50	7 x 2.33	6.99	21	73.1	0.1249	642	235	877	630
240/40	243	39.5	282.5	26 x 3.45	7 x 2.68	8.04	21.9	86.4	0.1188	677	310	987	645
265/35	263.7	34.1	297.8	24 x 3.74	7 x 2.49	7.47	22.4	83.05	0.1117	735	267	1002	680
300/50	304.3	49.5	353.7	26 x 3.86	7 x 3.00	9	24.5	107	0.0949	848	388	1236	740
305/40	304.6	39.5	344.1	54 x 2.68	7 x 2.68	8.04	24.1	99.4	0.0949	850	310	1160	740
340/30	339.3	29.8	369.1	48 x 3.00	7 x 2.33	6.99	25	92.9	0.0853	945	235	1180	790
380/50	382	49.5	431.5	54 x 3.00	7 x 3.00	9	27	123.1	0.0757	1065	388	1453	840
385/35	386	34.1	420.1	48 x 3.20	7 x 2.49	7.47	26.7	104.8	0.0749	1077	267	1344	850
435/55	434.3	56.3	490.6	54 x 3.20	7 x 3.20	9.6	28.8	136.45	0.0666	1210	443	1653	900
450/40	448.7	39.5	488.2	48 x 3.45	7 x 2.68	8.04	28.7	120.75	0.0644	1251	310	1561	920
490/65	490.3	63.6	553.9	54 x 3.40	7 x 3.40	10.2	30.6	153.1	0.59	1368	498	1866	960
495/35	494.1	34.1	528.2	45 x 3.74	7 x 2.49	7.47	29.9	121.8	0.0585	1381	235	1616	985
510/45	510.2	45.3	555.5	48 x 3.68	7 x 2.87	8.61	30.7	136.65	0.0565	1423	355	1778	995
550/70	550	71.3	621.3	54 x 3.60	7 x 3.60	10.8	32.4	170.6	0.0526	1532	560	2092	1020
560/50	561.7	49.5	611.2	48 x 3.86	7 x 3.00	9	32.2	148.95	0.0515	1566	388	1954	1040
570/40	571.2	39.5	610.7	45 x 4.02	7 x 2.68	8.04	32.2	136.2	0.0512	1578	310	1888	1050
650/45	635.5	45.3	698.8	45 x 4.30	7 x 2.87	8.61	34	55.5	0.0458	1816	355	2171	1120
680/85	678.8	86	764.6	54 x 4.00	19 x 2.40	12	36	206.25	0.0426	1890	676	2566	1150
1045/45	1045.6	45.3	1090.9	72 x 4.30	7 x 2.87	8.61	43	217.6	0.0277	2896	355	3251	1580

With following Conditions of conductor:
 Temperature: 35°C Conductor
 Temperature: 80°C
 Wind Velocity: 0.6 m/sea. with Solar Radiation



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Basic Technical Data of Stranded Conductors

Moduli of Elasticity and Coefficients of Linear Expansion for Constructions of Aluminium Conductors Steel-Reinforced to IEC Publ. No. 209

NO. OF WIRES		FINAL MODULUS OF ELASTICITY		COEFFICIENT OF LINEAR EXPANSION	
Al.	St	kg/mm ²	lb/in ²	1/C ^o	1/F ^o
6	1	81	11.5 x 10 ⁶	19.1 x 10 ⁻⁶	10.6 x 10 ⁻⁶
6	7	77	11.0 x 10 ⁶	19.8 x 10 ⁻⁶	11.0 x 10 ⁻⁶
12	7	107	15.2 x 10 ⁶	15.3 x 10 ⁻⁶	8.5 x 10 ⁻⁶
18	1	67	9.5 x 10 ⁶	21.2 x 10 ⁻⁶	11.8 x 10 ⁻⁶
24	7	74	10.5 x 10 ⁶	19.6 x 10 ⁻⁶	10.9 x 10 ⁻⁶
26	7	77	10.9 x 10 ⁶	18.9 x 10 ⁻⁶	10.5 x 10 ⁻⁶
28	7	79	11.2 x 10 ⁶	18.4 x 10 ⁻⁶	10.2 x 10 ⁻⁶
30	7	82	11.6 x 10 ⁶	17.8 x 10 ⁻⁶	9.9 x 10 ⁻⁶
30	19	80	11.4 x 10 ⁶	18.0 x 10 ⁻⁶	10.0 x 10 ⁻⁶
32	19	82	11.7 x 10 ⁶	17.5 x 10 ⁻⁶	9.7 x 10 ⁻⁶
54	7	70	9.9 x 10 ⁶	19.3 x 10 ⁻⁶	10.7 x 10 ⁻⁶
54	19	68	9.7 x 10 ⁶	19.4 x 10 ⁻⁶	10.8 x 10 ⁻⁶

Density at 20°C Aluminium: 2.703 kg/dm

Galvanised Steel: 7.80 kg/dm

Temperature Coefficient of 20°C Aluminium: 0.00403 (°C) Resistivity at 20°C

Aluminium: Should not exceed 0.028264

Linear Expansively Aluminium: 23 x 10 (°C)

Galvanised Steel: 11.5 x 10 (1/°C)

SPECIFICATIONS

NO. OF WIRES		FINAL MODULUS OF ELASTICITY	COEFFICIENT OF LINEAR EXPANSION
Al.	St	N/mm ²	1°C
6	1	81	19.1 x 10 ⁻⁶
6	7	77	19.8 x 10 ⁻⁶
12	7	107	15.3 x 10 ⁻⁶
18	1	67	21.2 x 10 ⁻⁶
24	7	74	19.6 x 10 ⁻⁶
26	7	77	18.9 x 10 ⁻⁶
28	7	79	18.4 x 10 ⁻⁶
30	7	82	17.8 x 10 ⁻⁶
30	19	80	18.0 x 10 ⁻⁶
32	19	82	17.5 x 10 ⁻⁶
54	7	70	19.3 x 10 ⁻⁶
54	19	68	19.4 x 10 ⁻⁶

All of the above information, including drawings, illustrations and graphic designs, reflects our present understanding and is to the best of our knowledge and belief correct reliable. Users, however, should independently evaluate the suitability of each product for the desired application. Under no circumstances does this constitute an assurance any particular quality or performance. Such an assurance is only provided in the context of our product specifications or explicit contractual arrangements. Our liability for products set forth our standard terms and conditions of sale



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