

Aluminum Conductor Steel Reinforced (ACSR) Cables

IEC 61089

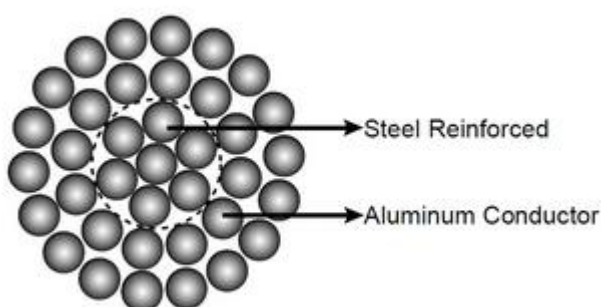
Application

ACSR conductors are widely used for electrical power transmission over long distances, since they are ideal for long overhead lines spans. They are also used as a messenger for supporting overhead electrical cables.

Standard

Basic design to IEC 61089 standards

Cable Construction



ACSR conductors are formed by several wires of aluminium and galvanized steel, stranded in concentric layers. The wire or wires which form the core, are made of galvanized steel and the external layer or layers, are of aluminium. Galvanized steel core consist normally of 1, 7 or 19 wires. The diameters of steel and aluminium wires can be the same, or different.

By varying the relative proportions of aluminium and steel, the required characteristics for any particular application can be reached. A higher U. T. S. Can be obtained, by increasing steel content, and a higher current carrying capacity by increasing aluminium content

Electrical Properties

Density@20°C	Aluminium: 2.703 kg/dm
	Galvanised Steel: 7.80 kg/dm
Temperature Coefficient@20°C	Aluminium: 0.00403 (°C)
Resistivity@20°C	Aluminium: Should not exceed 0.028264
Linear Expansivity	Aluminium: 23 x10 (°C)
	Galvanized Steel: 11.5 x10 (1/°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%

Technical Data

Numbers of Wires		Final Modules of Elasticity		Coefficient of linear Expansion	
AL	Steel	Kg/mm ²	lb/in ²	1/C ^o	1/F ^o
6	1	81	11.5 x106	19.1 x10-6	10.6 x10-6
6	7	77	11.0 x106	19.8 x10-6	11.0 x10-6
12	7	107	15.2 x106	15.3 x10-6	8.5 x10-6
18	1	67	9.5 x106	21.2 x10-6	11.8 x10-6
24	7	74	10.5 x106	19.6 x10-6	10.9 x10-6
26	7	77	10.9 x106	18.9 x10-6	10.5 x10-6
28	7	79	11.2 x106	18.4 x10-6	10.2 x10-6
30	7	82	11.6 x106	17.8 x10-6	9.9 x10-6
30	19	80	11.4 x106	18.0 x10-6	10.0 x10-6
32	19	82	11.7 x106	17.5 x10-6	9.7 x10-6
54	7	70	9.9 x106	19.3 x10-6	10.7 x10-6
54	19	68	9.7 x106	19.4 x10-6	10.8 x10-6

Construction Parameters

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Code	Nominal Area			Stranding		Overall Diameter	Weight	Breaking Load	Electrical Resistance @20°C	Current Rating*
	AL	Steel	Total	AL	Steel					
	mm ²	mm ²	mm ²	No./mm	No./mm	mm	Kg/Km	KN	Ω/Km	A
16	16	2.67	18.7	6/1.84	1/1.84	5.52	64.6	6.08	1.7934	85
25	25	4.17	29.2	6/2.30	1/2.30	6.9	100.9	9.13	1.1478	112
40	40	6.67	46.7	6/2.91	1/2.91	8.73	161.5	14.4	0.7174	150
63	63	10.5	73.5	6/3.66	1/3.66	10.98	254.4	21.63	0.4555	198
100	100	16.7	117	6/4.61	1/4.61	13.83	403.8	34.33	0.2869	263
125	125	6.94	132	18/2.97	1/2.97	14.85	397.9	29.17	0.2304	299
125	125	20.4	145	26/2.47	7/1.92	15.64	503.9	45.69	0.231	302
160	160	8.89	169	18/3.36	1/3.36	16.8	509.3	36.18	0.18	347
160	160	26.1	186	26/2.80	7/2.18	17.74	644.9	57.69	0.1805	351
200	200	11.1	211	18/3.76	1/3.76	18.8	636.7	44.22	0.144	398
200	200	32.6	233	26/3.13	7/2.43	19.81	806.2	70.13	0.1444	402
250	250	24.6	275	22/3.80	7/2.11	21.53	880.6	68.72	0.1154	458
250	250	40.7	291	26/3.50	7/2.72	22.16	1007.7	87.67	0.1155	461
315	315	21.8	337	45/2.99	7/1.99	23.91	1039.6	79.03	0.0917	526
315	315	51.3	366	26/3.93	7/3.05	24.87	1269.7	106.83	0.0917	530

400	400	27.7	428	45/3.36	7/2.24	26.88	1320.1	98.36	0.0722	607
400	400	51.9	452	54/3.07	7/3.07	27.63	1510.3	123.04	0.0723	610
450	450	31.1	481	45/3.57	7/2.38	28.56	1485.2	107.47	0.0642	651
450	450	58.3	508	54/3.26	7/3.26	29.34	1699.1	138.42	0.0643	655
500	500	34.6	535	45/3.76	7/2.51	30.09	1650.2	119.41	0.0578	693
500	500	64.8	565	54/3.43	7/3.43	30.87	1887.9	153.8	0.0578	697
560	560	38.7	599	45/3.98	7/2.65	31.83	1848.2	133.74	0.0516	741
560*	560	70.9	631	54/3.63	19/2.18	32.68	2103.4	172.59	0.0516	745
630	630	43.6	674	45/4.22	7/2.81	33.75	2079.2	150.45	0.0459	794
630*	630	79.8	710	54/3.85	19/2.31	34.65	2366.3	191.77	0.0459	798
710	710	49.1	759	45/4.48	7/2.99	35.85	2343.2	169.56	0.0407	851
710*	710	89.9	800	54/4.09	19/2.45	36.79	2666.8	216.12	0.0407	856
800*	800	34.6	835	72/3.76	7/2.51	37.61	2480.2	167.41	0.0361	910
800*	800	66.7	867	84/3.48	7/3.48	38.28	2732.7	205.33	0.0362	912
800*	800	101	901	54/4.34	19/2.61	39.09	3004.9	243.52	0.0362	916
900*	900	38.9	939	72/3.99	7/2.66	39.9	2790.2	188.33	0.0321	972
900*	900	75	975	84/3.69	7/3.69	40.59	3074.2	226.5	0.0322	974
1000*	1000	43.2	1043	72/4.21	7/2.80	42.08	3100.3	209.26	0.0289	1031
1120*	1120	47.3	1167	72/4.45	19/1.78	44.5	3464.9	234.53	0.0258	1096
1120*	1120	91.2	1211	84/4.12	19/2.47	45.31	3811.5	283.17	0.0258	1100
1250*	1250	102	1352	84/4.35	19/2.61	47.85	4253.9	316.04	0.0232	1165
1250*	1250	52.8	1303	72/4.70	19/1.88	47	3867.1	261.75	0.0231	1163

* The items marked with (*) 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.