

ACSS

Aluminum Conductor Steel Supported



Complete Conductor

ACCS is a composite concentric-lay-stranded cable. The steel strands form the central core of the cable, around which is stranded one or more layers of aluminum 1350-O wires. ACSS Conductors are manufactured in accordance with the requirements of the latest applicable issue of ASTM specification B856. The "O" temper of the aluminum, a fully annealed or soft temper, causes most or all of the mechanical load on ACSS to be carried by the steel. The steel core may consist of 7, 19, 37 or more wires. Class A zinc coating is usually adequate for ordinary environment.

Features and Benefits

ACSS conductors are similar to conventional ACSR with some very important additional advantages. ACSS can operate continuously at high temperatures (200°C) without damage. For conductor applications to 250°C, zinc-5% aluminum mischmetal alloy-coated steel or aluminum-clad steel should be considered. ACSS sags less under emergency electrical.

Loadings than ACSR, it is self-damping if prestretched during installation, and its final sags are not affected by long-time creep of the aluminum.

Applications

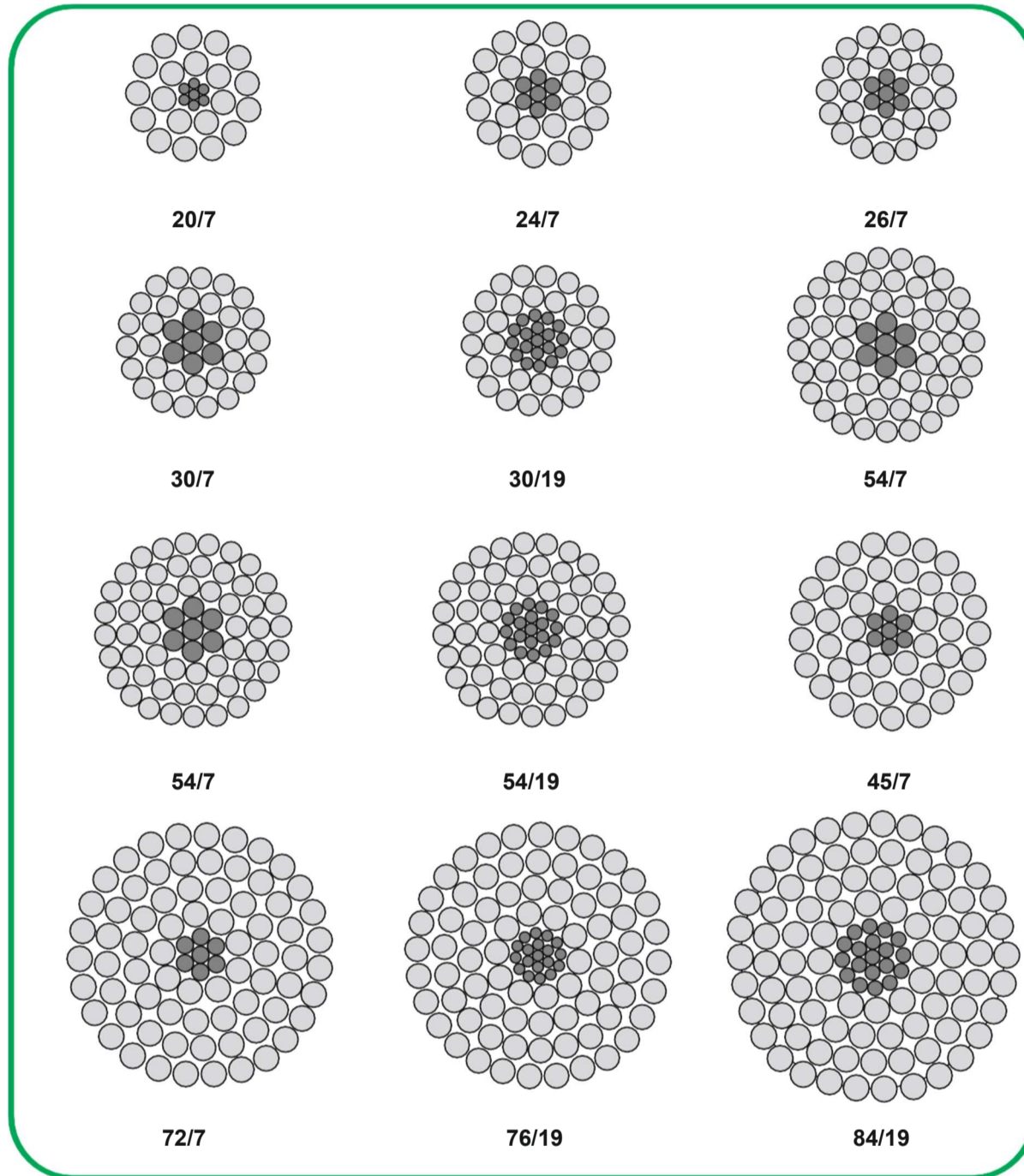
Aluminum conductor steel-supported (ACSS) is used for overhead transmission lines. It is especially useful in reconductoring applications requiring increased current with existing tensions and clearances; new line applications where structures can be economized due to reduced sag; new line applications requiring high emergency loadings; and lines where aeolian vibration is a problem.

Options:

1. High-strength class A galvanized steel core (/HS)
2. Extra-high-strength class A galvanized steel core (/EHS)
3. Ultra-high-strength class A galvanized steel core (/UHS)

4. Regular-strength class A zinc-5% aluminum misch-metal alloy-coated steel core (/MA)
5. High-strength class A zinc-5% aluminum misch-metal alloy-coated steel core (/MA)
6. Extra-high-strength class A zinc-5% aluminum misch-metal alloy-coated steel core (/EM)
7. Ultra-high-strength class A zinc-5% aluminum misch-metal alloy-coated steel core (/UM)
8. Aluminum-clad steel core (/AW).
9. 250°C operating temperature rating utilizing either the zinc-5% aluminum misch-metal alloy-coated steel core wires or the aluminum-clad steel core wires
10. Trapezoidal-shaped aluminum strands (/TW)

ACSS cross section according to the number of layers:



ASTM B856

(1) Resistance and ampacity based on an aluminum conductivity of 63 %, IACS at 20°C and a steel conductivity of 8% IACS at 20 °c.

(2) Ampacity based on a 200°C conductor temperature 25°C. Ambient temperature 2 ft/sec. wind in sun. Emissivity of 0.5. coefficient of solar absorption of 0.5 at sea level.

(3) Rated strength for standard strength core based on class A Galfan coated steel core wire in accordance with ASTM B 802.

Rated strength for high strength core based on class A Galfan coated high strength steel core wire in accordance with B803.

Code Word	Size (kcmil)	Stranding (Al/St)	Diameter			
			Individual Wires		Steel Core	Complete
			Aluminum	Steel		
mm						
Partridge	266.8	26/7	2.573	2.0015	6.002	16.3068
Junco	266.8	30/7	2.3952	2.3952	7.1857	16.764
Ostrich	300.0	26/7	2.728	2.1209	6.3652	17.272
Linnet	336.4	26/7	2.888	2.2479	6.7412	18.288
Oriole	336.4	30/7	2.6899	2.6899	8.0696	18.8214
Brant	397.5	24/7	3.269	2.1793	6.538	19.6088
Ibis	397.5	26/7	3.1394	2.4435	7.3279	19.8882
Lark	397.5	30/7	2.9235	2.9235	8.7706	20.4724
Flicker	477.0	24/7	3.5814	2.3876	7.1603	21.4884
Hawk	477.0	26/7	3.4392	2.6746	8.0264	21.7932
Hen	477.0	30/7	3.2029	3.2029	9.6088	22.4282
Parakeet	556.5	24/7	3.8684	2.5781	7.7343	23.2156
Dove	556.5	26/7	3.716	2.8905	8.669	23.5458
Eagle	556.5	30/7	3.4595	3.4595	10.3784	24.2062
Peacock	605	24/7	4.0335	2.6873	8.0645	24.2062
Squab	605	26/7	3.8735	3.0124	9.0399	24.5364
Wood Duck	605	30/7	3.6068	3.6068	10.8204	25.2476
Teal	605	30/19	3.6068	2.1641	10.8204	25.2476
Rook	636	24/7	4.1351	2.7559	8.2702	24.8158
Grosbeak	636	26/7	3.9726	3.0886	9.2685	25.1714
Seater	636	30/7	3.6982	3.6982	11.0947	25.8826
Egret	636	30/19	3.6982	2.22	11.0947	25.8826
Flamingo	666.6	24/7	4.2342	2.8219	8.4658	25.4
Gannet	666.6	26/7	4.0665	3.1623	9.4894	25.7556
Stilt	715.5	24/7	4.3866	2.9235	8.7706	26.3144
Starling	715.5	26/7	4.2139	3.2766	9.8323	26.6954
Redwin	715.5	30/19	3.9218	2.3546	11.7678	27.4574
Cuckoo	795	24/7	4.6228	3.081	9.2456	27.7368
Drake	795	26/7	4.4425	3.4544	10.3632	28.1178
Macaw	795	42/7	3.495	1.9406	5.8242	26.797
Tern	795	45/7	3.3757	2.2504	6.7513	27.0002
Condor	795	54/7	3.081	3.081	9.2456	27.7368
Mallard	795	30/19	4.1351	2.4816	12.4054	28.9306
Ruddy	900	45/7	3.5916	2.3952	7.1831	28.7274
Canary	900	54/7	3.2791	3.2791	9.8374	29.5148
Redbird	954	24/7	5.0648	3.3757	10.127	30.3784
Rail	954	45/7	3.6982	2.4663	7.3965	29.591
Towhee	954	48/7	3.5814	2.7864	8.3566	29.845
Cardinal	954	54/7	3.3757	3.3757	10.127	30.3784
Canvasback	954	30/19	4.5288	2.7178	13.589	31.6992

Weight			Rated Strength ³			Resistance ¹		Ampacity ² at 200°C AMPS
Aluminum	Steel	Total	Standard Strength	High Strength	HS285 Strength	DC at 20°C	AC at 75°C	
kg/km			kg			ohm/km		
373.98	171.88	545.86	4027.9	4413.5	5171	0.2031	0.2497	812
374.87	246.29	621.16	5307	5896.7	6894.6	0.2018	0.248	822
420.56	193.31	613.72	4535.9	4944.2	5806	0.1808	0.2221	877
471.45	216.83	688.28	5080.2	5579.2	6531.7	0.1611	0.1982	945
472.64	310.58	783.22	6713.2	7393.6	8663.6	0.1601	0.1969	957
557.17	203.88	761.05	4989.5	5488.5	6395.7	0.1368	0.1686	1047
557.17	256.11	813.28	5896.7	6441	7484.3	0.1365	0.168	1054
558.51	366.83	925.49	7937.9	8754.3	10251.2	0.1355	0.1667	1068
668.63	244.65	913.14	5896.7	6441	7438.9	0.1142	0.1407	1180
668.63	307.31	975.94	7076	7756.4	8981.1	0.1135	0.1401	1188
670.27	440.35	1110.62	9525.4	10296.5	12110.9	0.1129	0.1391	1204
779.95	285.43	1065.38	6894.6	7529.6	8709	0.0978	0.1207	1306
780.1	358.5	1138.59	8255.4	9026.5	10523.3	0.0974	0.1201	1315
781.88	513.71	1295.6	11113	12020.2	14106.7	0.0968	0.1191	1331
847.96	310.28	1158.24	7484.3	8210	9434.7	0.0899	0.1112	1379
847.96	389.75	1237.85	8935.8	9661.5	11430.5	0.0896	0.1106	1389
850.04	558.51	1408.55	11793.4	12836.7	15104.6	0.0889	0.1096	1407
850.04	546.75	1396.79	12065.6	13290.3	15785	0.0892	0.1099	1406
891.41	326.21	1217.62	7847.1	8618.3	9933.7	0.0856	0.1056	1425
891.41	409.84	1301.25	9389.4	10160.5	11793.4	0.0853	0.1053	1435
893.64	587.08	1480.72	12428.4	13471.7	15875.7	0.0846	0.1043	1454
893.64	574.88	1468.52	12700.6	14016	16601.5	0.0846	0.1047	1453
934.42	341.83	1276.25	8255.4	9026.5	10387.3	0.0817	0.101	1470
934.27	429.48	1363.75	9843	10614.1	12383.1	0.0814	0.1004	1480
1002.87	366.83	1369.85	8845.1	9661.5	11158.4	0.0761	0.0942	1540
1002.87	461.03	1463.91	10568.7	11430.5	13517.1	0.0758	0.0938	1550
1005.4	646.76	1652.01	13970.6	15422.1	18053	0.0755	0.0932	1570
1114.34	407.76	1521.95	9843	10568.7	12201.6	0.0686	0.085	1650
1114.34	512.23	1626.56	11748	12700.6	14787.1	0.0686	0.0843	1662
1114.34	161.76	1276.1	5352.4	5715.3	6486.4	0.0692	0.086	1621
1114.34	217.42	1331.76	6441	6894.6	7892.5	0.0689	0.0863	1618
1114.34	407.76	1521.95	9843	10568.7	12201.6	0.0686	0.0873	1618
1117.02	718.49	1835.5	15558.2	17191.2	20094.1	0.0679	0.0837	1683
1261.52	246.14	1507.66	7166.8	7711.1	8709	0.061	0.0764	1755
1261.52	461.48	1723	11158.4	11974.8	13834.6	0.0604	0.0774	1756
1337.12	489.16	1826.42	11793.4	12700.6	14651	0.0571	0.0712	1859
1337.12	260.88	1598.14	7575	8164.7	9253.3	0.0574	0.0722	1824
1337.12	332.9	1670.17	8935.8	9661.5	11022.3	0.0574	0.0715	1842
1337.26	489.16	1826.42	11793.4	12700.6	14651	0.0571	0.0732	1825
1340.39	862.24	2202.63	18642.6	20593.1	24085.8	0.0564	0.0702	1897

ASTM B856

(1) Resistance and ampacity based on an aluminum conductivity of 63 %, IACS at 20°C and a steel conductivity of 8% IACS at 20 °c.

(2) Ampacity based on a 200°C conductor temperature 25°C. Ambient temperature 2 ft/sec. wind in sun. Emissivity of 0.5. coefficient of solar absorption of 0.5 at sea level.

(3) Rated strength for standard strength core based on class A Galvan coated steel core wire in accordance with ASTM B 802.

Rated strength for high strength core based on class A Galvan coated high strength steel core wire in accordance with B803.

Code Word	Size (kcmil)	Stranding (Al/St)	Diameter			
			Individual Wires		Steel Core	Complete
			Aluminum	Steel		
mm						
Snowbird	1033.5	42/7	3.9853	2.2123	6.6396	30.5562
Ortolan	1033.5	45/7	3.8481	2.5654	7.6987	30.7848
Curlew	1033.5	54/7	3.5128	3.5128	10.541	31.623
Bluejay	1113	45/7	3.9954	2.6619	7.9883	31.9532
Finch	1113	54/19	3.6474	2.1869	10.9398	32.8168
Buntin	1192.5	45/7	4.1351	2.7559	8.2702	33.0708
Bittern	1272	45/7	4.2697	2.8473	8.5395	34.163
Pheasant	1272	54/19	3.8989	2.3393	11.6942	35.0774
Dipper	1351	45/7	4.4018	2.9337	8.8011	35.2044
Martin	1351	54/19	4.0183	2.4105	12.0523	36.1696
Bobolink	1431	45/7	4.5288	3.0201	9.0576	36.2458
Plover	1431	54/19	4.1351	2.4816	12.4054	37.211
Nuthatch	1510	45/7	4.6533	3.1013	9.3066	37.211
Parrot	1510	54/19	4.2469	2.5476	12.7432	38.227
Ratite	1590	42/7	4.9428	2.7457	8.2372	37.8968
Lapwing	1590	45/7	4.7752	3.1826	9.5479	38.2016
Falcon	1590	54/19	4.3586	2.6162	13.0759	39.2176
Chukar	1780	84/19	3.6982	2.2174	11.0922	40.6654
Mockingbird	2034.5	72/7	4.2697	2.8473	8.5395	42.6974
Roadrunner	2057	76/19	4.1783	1.9507	9.7511	43.18
Bluebird	2156	84/19	4.0691	2.4409	12.2072	44.7548
Kiwi	2167	72/7	4.4069	2.9388	8.8138	44.069
Thrasher	2312	76/19	4.4298	2.0676	10.3378	45.7708
Joree	2515	76/19	4.6203	2.1565	10.7823	47.752



Weight			Rated Strength ³			Resistance ¹		Ampacity ² at 200°C AMPS(2)
Aluminum	Steel	Total	Standard Strength	High Strength	HS285 Strength	DC at 20°C	AC at 75°C	
	kg						/km	
1448.58	210						0.0669	1924
1448.58	282						0.0669	1921
1448.58	530						0.0676	1924
1560.04	304						0.0623	2017
1567.63	538						0.0633	2015
1671.51	326						0.0584	2110
1782.97	347						0.0548	2200
1791.6	638						0.0554	2200
1893.69	369						0.0518	2289
1902.92	678						0.0525	2288
2005.75	397						0.0492	2375
2015.57	718						0.0495	2375
2116.47	412						0.0469	2459
2126.88	758.22	2884.95	18325.1	20048.8	23133.2	0.0364	0.0472	2460
2228.67	323.53	2552.2	10614.1	11339.8	12655.2	0.0344	0.0446	2543
2228.67	434.84	2663.52	12655.2	13426.3	15195.3	0.0344	0.0446	2543
2239.54	798.4	3037.94	19323	21137.4	24357.9	0.0344	0.0449	2545
2507.11	574.58	3081.69	16057.2	17327.2	19912.7	0.0308	0.04	2751
2865.61	347.78	3213.39	12337.7	13108.8	14515	0.0272	0.0361	2960
2897.31	443.92	3341.23	14378.9	15376.8	17372.6	0.0269	0.0354	2992
3036.75	695.87	3732.61	19096.2	20638.5	23450.7	0.0256	0.0338	3106
3052.22	370.4	3422.63	13154.2	13970.6	15467.5	0.0256	0.0341	3080
3256.4	498.98	3755.38	16147.9	17281.9	19504.5	0.024	0.0322	3218
3542.43	542.73	4085.16	17554	18778.7	21228.1	0.022	0.0302	3390

