



OVERHEAD ELECTRICAL

ALUMINUM CONDUCTORS

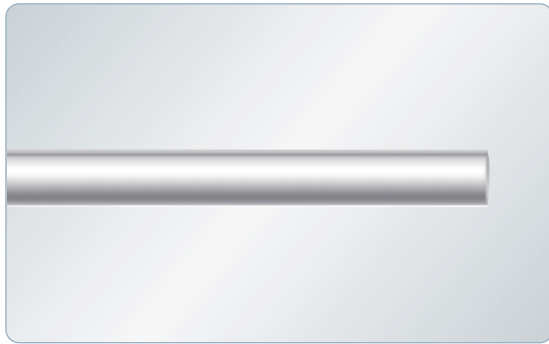
American Society for Testing and Materials

ASTM

American National Standards Institute

ANSI

HAL Hard-drawn Aluminum Wires for Electric Purposes



Application

This standard covers hard-drawn circular aluminum wires for electric purposes to be used mainly as component wires of hard-drawn aluminum stranded cables and aluminum cables steel reinforced.

Construction

Single aluminum conductor

Standards

Conforms to ASTM B 230-97

Tensile Requirements

(Table 24)

Diameter		Tolerance on Dia. (±%, or in)	Min. Tensile Strength				Min. Elongation in 10 in or 250mm (%)		Min. Volume Conductivity (% IACS, 20°C(68°F))	
in	mm		Average for a Lot		Individual Tests		Average for a Lot	Individual Tests	Average for a Lot	Individual Tests
			ksi	Mpa	ksi	Mpa				
0.2600 to 0.2101	6.604 to 5.337	1%	23.5	162	22.5	155	2.3	2.2	61.2	61.0
0.2100 to 0.1801	5.334 to 4.575	1%	24.0	165	23.0	159	2.1	2.0	61.2	61.0
0.1800 to 0.1501	4.572 to 3.813	1%	24.0	165	23.0	159	2.0	1.9	61.2	61.0
0.1500 to 0.1401	3.810 to 3.559	1%	24.5	169	23.5	162	1.9	1.8	61.2	61.0
0.1400 to 0.1201	3.556 to 3.051	1%	25.0	172	23.5	162	1.8	1.7	61.2	61.0
0.1200 to 0.1101	3.048 to 2.797	1%	25.5	176	24.0	165	1.7	1.6	61.2	61.0
0.1101 to 0.1001	2.794 to 2.543	1%	26.0	179	24.5	169	1.6	1.5	61.2	61.0
0.1000 to 0.0901	2.540 to 2.289	0.0010 in	27.0	186	25.5	176	1.6	1.5	61.2	61.0
0.0900 to 0.0801	2.286 to 2.035	0.0010 in	27.5	190	26.0	179	1.6	1.5	61.2	61.0
0.0800 to 0.0701	2.032 to 1.781	0.0010 in	28.0	193	26.5	183	1.6	1.4	61.2	61.0
0.0700 to 0.0601	1.778 to 1.527	0.0010 in	28.5	197	27.0	186	1.5	1.3	61.2	61.0
0.0600 to 0.0501	1.524 to 1.273	0.0010 in	29.0	200	27.0	186	1.4	1.2	61.2	61.0
0.0500 to 0.0105	1.270 to 0.267	0.0010 in	25.0	172	23.0	159	-	-	61.2	61.0

Equivalent Resistivity Values at 20° C(68° F)

(Table 25)

Material	Volume Conductivity (% IACS)	Resistivity Constants					
		Volume				Weight	
		Ω · cmil/ft	Ω · mm ² /m	μΩ · in	μΩ · cm	Ω · lb/mile ²	Ω · g/m ²
Copper	100	10.371	0.017241	0.67879	1.7241	875.20	0.15328
Aluminum	61.0	17.002	0.028265	1.1128	2.8265	436.23	0.076399
Aluminum	61.2	16.946	0.028172	1.1091	2.8172	434.81	0.076149

Zinc-coated(galvanized) Steel Core Wire (ASTM B 498-93)

Tensile Requirements and Permissible Variations in Diameter

(Table 26)

Nominal Dia.		Min. Stress at 1% Extension		Min. Ultimate Tensile Strength		Min. Elogation in 10 in or 250mm (%)	Permissible Variation			
							in		mm	
in	mm	ksi	Mpa	ksi	Mpa		Plus	Minus	Plus	Minus

Class A Coating

0.0500 to 0.0899	1.270 to 2.283	190	1,310	210	1,450	3.0	0.0015	0.001	0.038	0.025
0.0900 to 0.1199	2.286 to 3.045	185	1,280	205	1,410	3.5	0.002	0.002	0.051	0.051
0.1200 to 0.1399	3.048 to 3.553	180	1,240	205	1,410	4.0	0.003	0.002	0.076	0.051
0.1400 to 0.1900	3.556 to 4.822	170	1,170	200	1,380	4.0	0.004	0.003	0.102	0.076

Class B Coating

0.0500 to 0.0899	1.270 to 2.283	180	1,240	200	1,380	3.0	0.0015	0.001	0.038	0.025
0.0900 to 0.1199	2.286 to 3.045	175	1,210	195	1,340	3.0	0.002	0.002	0.051	0.051
0.1200 to 0.1399	3.048 to 3.553	170	1,170	195	1,340	3.0	0.003	0.002	0.076	0.051
0.1400 to 0.1900	3.556 to 4.822	160	1,100	185	1,280	4.0	0.004	0.003	0.102	0.076

Class C Coating

0.0500 to 0.0899	1.270 to 2.283	170	1,170	190	1,310	3.0	0.0015	0.001	0.038	0.025
0.0900 to 0.1199	2.286 to 3.045	165	1,140	185	1,280	3.0	0.002	0.002	0.051	0.051
0.1200 to 0.1399	3.048 to 3.553	160	1,100	185	1,280	3.0	0.003	0.002	0.076	0.051
0.1400 to 0.1900	3.556 to 4.822	155	1,070	180	1,240	4.0	0.004	0.003	0.102	0.076

Minimum Weight of Coating and Mandrel Size for Adherence Test

(Table 27)

Nominal Dia. of Coated Wire		Min. Weight of Zinc-coating oz/ft ² of Uncoated Wire Surface			Min. Weight of Zinc-coating g/m ² of Uncoated Wire Surface			Ratio of Mandrel Dia. to Wire Dia.
		Coating			Coating			
in	mm	Class A	Class B	Class C	Class A	Class B	Class C	
0.0500 to 0.0599	1.270 to 1.521	0.60	1.20	1.80	183	366	549	3
0.0600 to 0.0749	1.524 to 1.902	0.65	1.30	1.95	198	396	590	3
0.0750 to 0.0899	1.905 to 2.283	0.70	1.40	2.10	214	437	610	3
0.0900 to 0.1039	2.286 to 2.639	0.75	1.50	2.25	229	458	686	4
0.1040 to 0.1199	2.642 to 3.045	0.80	1.60	2.40	244	488	732	4
0.1200 to 0.1399	3.048 to 3.553	0.85	1.70	2.55	259	518	778	4
0.1400 to 0.1799	3.556 to 4.569	0.90	1.80	2.70	274	549	824	5
0.1800 to 0.1900	4.572 to 4.822	1.00	2.00	3.00	305	610	915	5

AAC Stranded Hard-drawn Aluminum Conductor



Application

This standard covers stranded hard-drawn aluminum conductors to be used mainly for overhead distribution wire, overhead feeders and buses.

Construction

Stranded hard-drawn aluminum conductor

Standards

Conforms to ASTM B 231-95

(Table 28)

Code Word	Conductor Size		Stranding		Conductor Dia. (in)	Weight (lb/1000ft)	Rated Strength (lb)	Calculated Resistance at 20 °C (68 °F) (Ω /1000ft)	Ampacity (amps)
	AWG or CMILS	sq in	Class	No. and Dia. of Strands (in)					
Peachbell	6	0.0206	A	7 × 0.0612	0.184	24.6	563	0.6609	103
Rose	4	0.0328	A	7 × 0.0772	0.232	39.1	881	0.4155	138
Lily	3	0.0413	A	7 × 0.0867	0.260	49.4	1,023	0.3296	159
Iris	2	0.0521	A&AA	7 × 0.0974	0.292	62.2	1,350	0.2613	185
Pansy	1	0.0657	A&AA	7 × 0.1093	0.328	78.4	1,640	0.2072	214
Poppy	1/0	0.0829	A&AA	7 × 0.1228	0.368	98.9	1,990	0.1642	247
Aster	2/0	0.1045	A&AA	7 × 0.1379	0.414	124.8	2,510	0.1303	286
Phlox	3/0	0.1318	A&AA	7 × 0.1548	0.464	157.2	3,040	0.1033	330
Oxlip	4/0	0.1662	A&AA	7 × 0.1739	0.522	198.4	3,830	0.08196	382
Sneezewort	250,000	0.1964	AA	7 × 0.1890	0.567	234.4	4,520	0.0694	414
Valerian	250,000	0.1964	A	19 × 0.1147	0.574	234.7	4,510	0.0694	416
Daisy	266,800	0.2095	AA	7 × 0.1953	0.586	250.2	4,830	0.06500	442
Laurel	266,800	0.2095	A	19 × 0.1185	0.593	250.1	4,970	0.06500	444
Peony	300,000	0.2356	A	19 × 0.1257	0.629	281.4	5,480	0.0578	458
Tulip	336,400	0.2642	A	19 × 0.1331	0.666	315.5	6,150	0.0515	513
Daffodil	350,000	0.2749	A	19 × 0.1357	0.679	327.9	6,390	0.0496	521
Canna	397,500	0.3122	A&AA	19 × 0.1447	0.724	372.9	7,110	0.04363	570
Goldentuft	450,000	0.3534	AA	19 × 0.1539	0.770	421.8	7,890	0.0386	612
Cosmos	477,000	0.3746	AA	19 × 0.1584	0.792	446.8	8,360	0.03636	639
Syringa	477,000	0.3746	A	37 × 0.1135	0.795	446.8	8,690	0.03636	640
Zinnia	500,000	0.3927	AA	19 × 0.1622	0.811	468.5	8,760	0.347	669
Hyacinth	500,000	0.3927	A	37 × 0.1162	0.813	468.3	9,110	0.347	670
Dahlia	556,500	0.4371	A	19 × 0.1711	0.856	521.4	9,750	0.03116	703
Mistletoe	556,500	0.4371	A&AA	37 × 0.1226	0.858	521.3	9,940	0.03116	704
Meadowsweet	600,000	0.4717	A&AA	37 × 0.1273	0.891	562.0	10,700	0.0289	721
Orchid	636,000	0.4995	AA	37 × 0.1311	0.918	596.0	11,400	0.02727	765
Heuchera	650,000	0.5105	AA	37 × 0.1326	0.928	609.8	11,600	0.0267	782
Verbena	700,000	0.5498	AA	37 × 0.1375	0.963	655.7	12,500	0.0248	804
Flag	700,000	0.5498	A	61 × 0.1071	0.964	655.8	12,900	0.0248	805
Violet	715,500	0.5620	AA	37 × 0.1391	0.974	671.0	12,800	0.02424	823

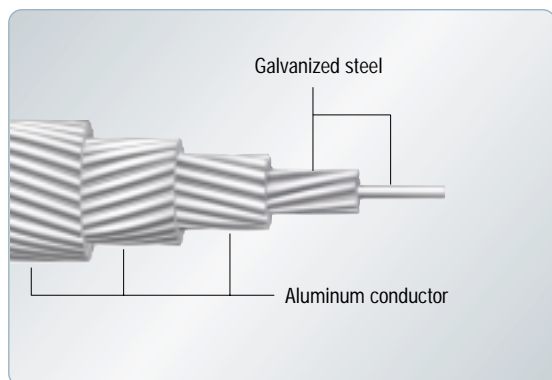
Notes : Class AA - For bare conductors usually used in overhead lines.
Class A - For conductors to be covered with weather-resistant materials.

(Table 28)

Code Word	Conductor Size		Stranding		Conductor Dia. (in)	Weight (lb/1000ft)	Rated Strength (lb)	Calculated Resistance at 20 °C (68 °F) (Ω /1000ft)	Ampacity (amps)
	AWG or CMILS	sq in	Class	No. and Dia. of Wires (in)					
Nasturtium	715,500	0.5620	A	61 × 0.1083	0.975	671.0	13,100	0.02424	824
Petunia	750,000	0.5890	AA	37 × 0.1424	0.997	703.2	13,100	0.0231	842
Cattail	750,000	0.5890	A	61 × 0.1109	0.998	703.2	13,500	0.0231	848
Arbutus	795,000	0.6244	AA	37 × 0.1466	1.026	745.3	13,900	0.02181	874
Lilac	795,000	0.6244	A	61 × 0.1142	1.028	745.7	14,300	0.02181	878
Anemone	874,500	0.6868	AA	37 × 0.1538	1.077	821.0	14,830	0.01983	932
Crocus	874,500	0.6868	A	61 × 0.1198	1.078	821.0	15,760	0.01983	932
Cockscomb	900,000	0.7069	AA	37 × 0.1560	1.092	844.0	16,400	0.0193	938
Snapdragon	900,000	0.7069	A	61 × 0.1215	1.094	844.0	15,900	0.0193	943
Magnolia	954,000	0.7493	AA	37 × 0.1606	1.124	894.5	16,400	0.01818	982
Goldenrod	954,000	0.7493	A	61 × 0.1251	1.126	894.8	16,900	0.01818	982
Hawkweed	1,000,000	0.7854	AA	37 × 0.1644	1.151	937.3	17,200	0.0174	1,003
Camellia	1,000,000	0.7854	A	61 × 0.1280	1.152	936.8	17,700	0.0173	1,005
Bluebell	1,033,500	0.8117	AA	37 × 0.1671	1.170	968.4	17,700	0.01678	1,031
Larkspur	1,033,500	0.8117	A	61 × 0.1302	1.172	969.2	18,300	0.01678	1,032
Marigold	1,113,000	0.8741	A&AA	61 × 0.1351	1.216	1,044	19,700	0.01558	1,079
Hawthorn	1,192,500	0.9366	A&AA	61 × 0.1398	1.258	1,117	21,100	0.01454	1,125
Narcissus	1,272,000	0.9990	A&AA	61 × 0.1444	1.300	1,192	22,000	0.01363	1,170
Columbine	1,351,000	1.062	A&AA	61 × 0.1488	1.339	1,266	23,400	0.01283	1,212
Carnation	1,431,000	1.124	A&AA	61 × 0.1532	1.379	1,342	24,300	0.01212	1,254
Gladiolus	1,510,500	1.186	A&AA	61 × 0.1574	1.417	1,417	25,600	0.01148	1,295
Coreopsis	1,590,000	1.249	AA	61 × 0.1614	1.453	1,489	27,000	0.01091	1,334
Dogwood	1,590,000	1.249	A	91 × 0.1322	1.454	1,493	28,100	0.01091	1,334
Jessamine	1,750,000	1.374	AA	61 × 0.1694	1.525	1,641	29,700	0.00991	1,499
Cowslip	2,000,000	1.570	A	91 × 0.1482	1.630	1,873	34,200	0.00868	1,595
Sagebrush	2,250,000	1.766	A	91 × 0.1572	1.729	2,128	37,700	0.00779	1,686
Lupine	2,500,000	1.962	A	91 × 0.1657	1.823	2,365	41,900	0.00701	1,772
Bitterroot	2,750,000	2.158	A	91 × 0.1738	1.912	2,602	46,100	0.00637	1,953
Trillium	3,000,000	2.350	A	127 × 0.1537	1.996	2,840	50,300	0.00584	2,283
Bluebonnet	3,500,000	2.749	A	127 × 0.1660	2.158	3,345	58,700	0.00505	2,689

Notes : Class AA - For bare conductors usually used in overhead lines.
Class A - For conductors to be covered with weather-resistant materials.

ACSR Aluminum Conductors, Steel Reinforced



Application

This standard covers aluminum stranded conductors steel reinforced which could withstand high tensile load to be used mainly for overhead transmission lines, overhead distribution lines.

Construction

The center wire or wires are of galvanized steel and the outer layer or layers of aluminum.

Standards

Conforms to ASTM B 232-97

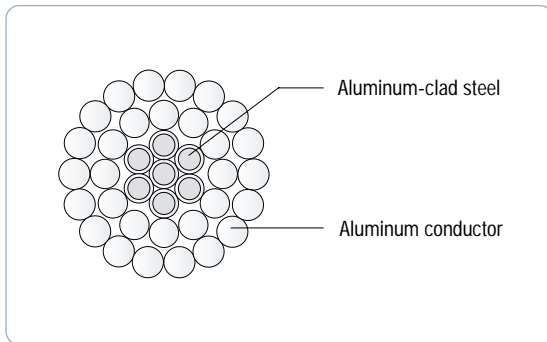
(Table 29)

Code Word	Conductor Size					Outside Dia.		Weight			Ultimate Strength (lb)	Resistance at 20 °C (Ω/1000ft)	Ampacity (Amps)
	AWG or CMILS	Cross Sectional Area (sq in)		Stranding		(in)		(lb/1000ft)					
		Al	Total	Al	St	Complete Cable	Steel Core	Total	Al	St			
Turkey	6	0.0206	0.0240	6×0.0661	1×0.0661	0.198	0.0661	36.1	24.5	11.6	1,190	0.6577	104
Thrush	5	0.0260	0.0303	6×0.0743	1×0.0743	0.223	0.0743	45.5	30.9	14.6	1,490	-	-
Swan	4	0.0328	0.0383	6×0.0834	1×0.0834	0.250	0.0834	57.4	39.0	18.4	1,860	0.4134	139
Swanate	4	0.0328	0.0411	7×0.0772	1×0.1029	0.257	0.1029	67.0	39.0	28.0	2,360	0.4134	139
Swallow	3	0.0413	0.0482	6×0.0937	1×0.0937	0.281	0.0937	72.4	49.2	23.3	2,250	-	-
Sparrow	2	0.0521	0.0608	6×0.1052	1×0.1052	0.316	0.1052	91.3	62.0	29.3	2,850	0.2601	183
Sparate	2	0.0521	0.0653	7×0.0974	1×0.1299	0.325	0.1299	106.7	62.0	44.7	3,640	0.2601	184
Robin	1	0.0657	0.0767	6×0.1181	1×0.1181	0.354	0.1181	115.2	78.2	37.0	3,550	0.2062	210
Raven	1/0	0.0829	0.0967	6×0.1327	1×0.1327	0.398	0.1327	145.2	98.6	46.6	4,380	0.1634	240
Quail	2/0	0.1045	0.1219	6×0.1489	1×0.1489	0.447	0.1489	183.1	124.3	58.8	5,300	0.1297	275
Pigeon	3/0	0.1318	0.1538	6×0.1672	1×0.1672	0.502	0.1672	230.8	156.8	74.0	6,620	0.1028	316
Penguin	4/0	0.1662	0.1939	6×0.1878	1×0.1878	0.563	0.1878	291.1	197.7	93.4	8,350	0.8155	360
Waxwing	266,800	0.2095	0.2211	18×0.1217	1×0.1217	0.609	0.1217	290	250.5	39.2	6,900	0.06500	448
Partridge	266,800	0.2095	0.2436	26×0.1013	7×0.0788	0.642	0.2364	367	251.7	115.6	11,300	0.06532	457
Ostrich	300,000	0.2356	0.2740	26×0.1074	7×0.0835	0.680	0.2505	413	283.0	129.8	12,700	0.05809	492
Merlin	336,400	0.2642	0.2789	18×0.1367	1×0.1367	0.684	0.1367	365	315.8	49.5	8,620	0.05155	518
Linnet	336,400	0.2642	0.3072	26×0.1137	7×0.0884	0.720	0.2652	463	317.3	145.8	14,100	0.05181	528
Oriole	336,400	0.2642	0.3259	30×0.1059	7×0.1059	0.741	0.3177	527	318.1	209	17,300	0.05193	534
Chickadee	397,500	0.3122	0.3295	18×0.1486	1×0.1486	0.743	0.1486	432	373.2	58.5	9,900	0.04363	575
Brant	397,500	0.3122	0.3525	24×0.1287	7×0.0858	0.772	0.2574	512	375	137	14,600	0.04384	578
Ibis	397,500	0.3122	0.3630	26×0.1236	7×0.0961	0.783	0.2883	547	375.0	171.9	16,300	0.04384	586
Lark	397,500	0.3122	0.3850	30×0.1151	7×0.1151	0.806	0.3453	623	375.9	246.9	20,300	0.04395	593
Pelican	477,000	0.3746	0.3954	18×0.1628	1×0.1628	0.814	0.1628	518	447.8	70.2	11,800	0.03636	644
Flicker	477,000	0.3746	0.4232	24×0.1410	7×0.0940	0.846	0.2820	615	450.0	164.5	17,200	0.03654	654
Hawk	477,000	0.3746	0.4356	26×0.1354	7×0.1053	0.858	0.3159	657	450.0	206.8	19,500	0.03654	658
Hen	477,000	0.3746	0.4620	30×0.1261	7×0.1261	0.883	0.3783	747	451.1	296.3	23,800	0.03662	665
Osprey	556,500	0.4371	0.4614	18×0.1758	1×0.1758	0.879	0.1758	604	522.4	81.9	13,700	0.03116	708
Parakeet	556,500	0.4371	0.4938	24×0.1523	7×0.1015	0.914	0.3045	717	525.0	191.8	19,800	0.03132	718
Dove	556,500	0.4371	0.5083	26×0.1463	7×0.1138	0.927	0.3414	766	525.0	241.1	22,600	0.03132	725
Eagle	556,500	0.4371	0.5391	30×0.1362	7×0.1362	0.953	0.4086	872	526.3	345.7	27,800	0.03139	732
Peacock	605,000	0.4752	0.5368	24×0.1588	7×0.1059	0.953	0.3177	780	570.7	208.8	21,600	0.02880	757
Squab	605,000	0.4752	0.5526	26×0.1525	7×0.1186	0.966	0.3558	833	570.7	261.9	24,300	0.02820	762
Wood Duck	605,000	0.4752	0.5861	30×0.1420	7×0.1420	0.994	0.4260	948	572	376	28,900	0.0289	769
Teal	605,000	0.4752	0.5835	30×0.1420	19×0.0852	0.994	0.2556	940	572.1	367.6	30,000	0.0289	772
Rook	636,000	0.4955	0.5643	24×0.1628	7×0.1085	0.997	0.3255	819	600.0	219.2	22,600	0.02740	782

(Table 29)

Code Word	Conductor Size					Outside Dia.		Weight			Ultimate Strength (lb)	Resistance at 20 °C (Ω/1000ft)	Ampacity (Amps)
	AWG or CMILS	Cross Sectional Area (sq in)		Stranding		(in)		(lb/1000ft)					
		Al	Total	Al	St	Complete Cable	Steel Core	Total	Al	St			
Grosbeak	636,000	0.4995	0.5809	26 ×0.1564	7 ×0.1216	0.990	0.3648	875	600.0	275.3	25,200	0.02740	787
Swift	636,000	0.4975	0.5134	36 ×0.1329	1 ×0.1329	0.930	0.1329	644	597	47	13,800	0.0274	784
Scoter	636,000	0.4995	0.6161	30 ×0.1456	7 ×0.1456	1.019	0.4368	993	601	392	30,400	0.0275	792
Kingbird	636,000	0.4995	0.5292	18 ×0.1880	1 ×0.1880	0.940	0.1880	690	597	93	15,700	0.0273	778
Egret	636,000	0.4995	0.6134	30 ×0.1456	19 ×0.0874	1.019	0.4370	988	601.4	386.8	31,500	0.02747	797
Flamingo	666,600	0.5235	0.5914	24 ×0.1667	7 ×0.1111	1.000	0.3333	859	628.8	229.8	23,700	0.02614	805
Gannet	666,600	0.5235	0.6087	26 ×0.1601	7 ×0.1245	1.014	0.3735	918	629	289	26,400	0.0261	809
Crow	715,500	0.5620	0.6348	54 ×0.1151	7 ×0.1151	1.036	0.3453	921	675.0	246.4	26,300	0.02436	825
Starling	715,500	0.5620	0.6535	26 ×0.1659	7 ×0.1290	1.051	0.3870	985	675.0	309.8	28,400	0.02436	847
Redwing	715,500	0.5620	0.6901	30 ×0.1544	19 ×0.0926	1.081	0.4630	1,111	676.6	434.2	34,600	0.02442	858
Stilt	715,500	0.5628	0.6356	24 ×0.1727	7 ×0.1151	1.036	0.3453	922	675	247	25,500	0.02436	845
Drake	795,000	0.6244	0.7261	26 ×0.1749	7 ×0.1360	1.108	0.4080	1,094	750.0	344.3	31,500	0.02192	903
Mallard	795,000	0.6244	0.7668	30 ×0.1628	19 ×0.0977	1.140	0.4885	1,235	751.8	483.3	38,400	0.02197	913
Tern	795,000	0.6244	0.6676	45 ×0.1329	7 ×0.0886	1.063	0.2658	896	750.0	146.0	22,100	0.02192	875
Condor	795,000	0.6244	0.7053	54 ×0.1213	7 ×0.1213	1.092	0.3639	1,024	750.0	274.1	28,200	0.02192	881
Coot	795,000	0.6244	0.6417	36 ×0.1486	1 ×0.1486	1.040	0.1486	805	746	59	16,800	0.0218	905
Cuckoo	795,000	0.6244	0.7053	24 ×0.1820	7 ×0.1213	1.092	0.3639	1,024	750	274	27,900	0.0219	894
Crane	874,500	0.6868	0.7759	54 ×0.1273	7 ×0.1273	1.146	0.3819	1,126	825.0	301.4	31,400	0.01993	935
Canary	900,000	0.7069	0.7985	54 ×0.1291	7 ×0.1291	1.162	0.3873	1,159	849.0	310.0	31,900	0.01936	926
Ruddy	900,000	0.7069	0.7555	45 ×0.1414	7 ×0.0943	1.131	0.2829	1,015	849	166	24,400	0.0194	918
Rail	954,000	0.7493	0.8011	45 ×0.1456	7 ×0.0971	1.165	0.2913	1,075	900.0	175.0	25,900	0.01827	953
Cardinal	954,000	0.7493	0.8464	54 ×0.1329	7 ×0.1329	1.196	0.3987	1,229	900.0	328.5	33,800	0.01827	960
Catbird	954,000	0.7493	0.7701	36 ×0.1628	1 ×0.1628	1.140	0.1628	966	896	70	19,800	0.0181	972
Ortolan	1,033,500	0.8117	0.8678	45 ×0.1515	7 ×0.1010	1.212	0.3030	1,165	975.0	190.0	27,700	0.01686	1,005
Curlew	1,033,500	0.8117	0.9169	54 ×0.1383	7 ×0.1383	1.245	0.4149	1,331	975.0	356.3	36,600	0.01686	1,010
Tanager	1,033,500	0.8117	0.8342	36 ×0.1694	1 ×0.1694	1.186	0.1694	1,046	970	76	21,400	0.0167	1,007
Bluejay	1,113,000	0.8741	0.9346	45 ×0.1573	7 ×0.1049	1.259	0.3147	1,255	1,050	205	29,800	0.01566	1,051
Finch	1,113,000	0.8741	0.9849	54 ×0.1436	19 ×0.0862	1.293	0.4310	1,431	1,055	376	39,100	0.01573	1,060
Bunting	1,192,500	0.9367	1.001	45 ×0.1628	7 ×0.1085	1.302	0.3255	1,344	1,125	219	32,000	0.01461	1,099
Grackle	1,192,500	0.9366	1.055	54 ×0.1486	19 ×0.0892	1.338	0.4460	1,533	1,130	403	41,900	0.01469	1,108
Bittern	1,272,000	0.9990	1.068	45 ×0.1681	7 ×0.1121	1.345	0.3363	1,434	1,200	234	34,100	0.01370	1,145
Pheasant	1,272,000	0.9990	1.126	54 ×0.1535	19 ×0.0921	1.382	0.4605	1,635	1,205.8	429.5	43,600	0.01377	1,148
Dipper	1,351,500	1.062	1.135	45 ×0.1733	7 ×0.1151	1.386	0.3453	1,523	1,275	248	36,200	0.01290	1,188
Martin	1,351,500	1.0625	1.196	54 ×0.1582	19 ×0.0949	1.424	0.4745	1,737	1,281.2	456	46,300	0.01296	1,198
Bobolink	1,431,000	1.124	1.202	45 ×0.1783	7 ×0.1189	1.427	0.3567	1,613	1,350	263	38,300	0.01218	1,227
Plover	1,431,000	1.124	1.266	54 ×0.1628	19 ×0.0977	1.465	0.4885	1,840	1,356.5	483.3	49,100	0.01224	1,237
Nuthatch	1,510,500	1.186	1.268	45 ×0.1832	7 ×0.1221	1.466	0.3663	1,702	1,425	277	40,100	0.01154	1,268
Parrot	1,510,500	1.186	1.337	54 ×0.1672	19 ×0.1003	1.505	0.5015	1,942	1,432	510	51,700	0.01159	1,278
Lapwing	1,590,000	1.249	1.335	45 ×0.1880	7 ×0.1253	1.504	0.3759	1,792	1,500	292	42,200	0.01096	1,310
Falcon	1,590,000	1.249	1.407	54 ×0.1716	19 ×0.1030	1.545	0.5150	2,044	1,507	537	54,500	0.01101	1,313
Chukar	1,780,000	1.398	1.512	84 ×0.1456	19 ×0.0874	1.602	0.4370	2,074	1,687	387	51,000	0.00984	1,434
Bluebird	2,156,000	1.693	1.828	84 ×0.1602	19 ×0.0961	1.762	0.4805	2,512	2,044	468	60,300	0.0080	1,620
Kiwi	2,167,000	1.702	1.776	72 ×0.1735	7 ×0.1157	1.735	0.3471	2,304	2,055	249	49,800	0.0080	1,634
Thrasher	2,312,000	1.816	1.915	76 ×0.1744	19 ×0.0814	1.802	0.4070	2,527	2,191	336	56,700	0.00749	1,875

ACSR/AW Aluminum Conductors, Aluminum-clad Steel Reinforced



Application

This standard covers aluminum stranded conductors aluminum-clad steel reinforced which could withstand high tensile load to be used mainly for overhead transmission lines, overhead distribution lines.

Construction

The center wire or wires are of aluminum-clad steel and the outer layer or layers of aluminum.

Standards

Conforms to ASTM B 549-93

(Table 30)

Conductor Size (Al Wire)			Class	Stranding						Rated Strength		Linear Density	
CMILS	AWG	mm ²		Aluminum			Aluminum-clad Steel			kips (1000 lbf)	kN	lb/1000ft	kg/km
				No. of Wires	Nominal Dia.		No. of Wires	Nominal Dia.					
				in	mm		in	mm					
2,312,000	...	1,171	AA	76	0.1744	4.430	19	0.0814	2.068	55.3	246	2,472	3,678
2,167,000	...	1,098	AA	72	0.1735	4.407	7	0.1157	2.939	49.1	219	2,262	3,367
2,156,000	...	1,092	AA	84	0.1602	4.069	19	0.0961	2.441	59.0	262	2,437	3,528
1,780,000	...	901.9	AA	84	0.1456	3.698	19	0.0874	2.220	49.4	220	2,013	2,995
1,590,000	...	805.7	AA	54	0.1716	4.359	19	0.1030	2.616	53.0	236	1,960	2,917
1,590,000	...	805.7	AA	45	0.1880	4.775	7	0.1253	3.183	41.8	186	1,746	2,598
1,510,000	...	765.1	AA	54	0.1672	4.247	19	0.1003	2.548	50.3	224	1,860	2,768
1,510,000	...	765.1	AA	45	0.1832	4.653	7	0.1221	3.101	39.7	176	1,658	2,467
1,431,000	...	725.1	AA	54	0.1628	4.135	19	0.0977	2.482	47.7	212	1,764	2,625
1,431,000	...	725.1	AA	45	0.1783	4.529	7	0.1189	3.020	37.6	167	1,570	2,337
1,351,000	...	684.6	AA	54	0.1582	4.018	19	0.0949	2.410	45.1	200	1,665	2,478
1,351,000	...	684.6	AA	45	0.1733	4.402	7	0.1155	2.934	35.5	158	1,483	2,207
1,272,000	...	644.5	AA	54	0.1535	3.899	19	0.0921	2.339	42.4	189	1,568	2,333
1,272,000	...	644.5	AA	45	0.1681	4.270	7	0.1121	2.847	33.4	149	1,396	2,077
1,272,000	...	644.5	AA	36	0.1880	4.775	1	0.1880	4.775	25.7	114	1,272	1,893
1,192,500	...	604.2	AA	54	0.1486	3.774	19	0.0892	2.266	40.2	179	1,470	2,187
1,192,500	...	604.2	AA	45	0.1628	4.135	7	0.1085	2.756	31.3	139	1,309	1,948
1,113,000	...	564.0	AA	54	0.1436	3.647	19	0.0862	2.189	37.5	167	1,373	2,043
1,113,000	...	564.0	AA	45	0.1573	3.995	7	0.1049	2.664	29.3	130	1,222	1,819
1,033,500	...	523.7	AA	54	0.1383	3.513	7	0.1383	3.513	35.6	158	1,274	1,896
1,033,500	...	523.7	AA	45	0.1515	3.848	7	0.1010	2.565	27.1	121	1,134	1,687
1,033,500	...	523.7	AA	36	0.1694	4.303	1	0.1694	4.303	21.1	93.7	1,033	1,537
954,000	...	483.4	AA	54	0.1329	3.376	7	0.1329	3.376	32.9	146	1,177	1,751
954,000	...	483.4	AA	45	0.1456	3.698	7	0.0971	2.466	25.4	113	1,047	1,558
954,000	...	483.4	AA	36	0.1628	4.135	1	0.1628	4.135	19.5	86.6	954	1,419
900,000	...	456.0	AA	54	0.1291	3.279	7	0.1291	3.279	31.0	138	1,111	1,653
900,000	...	456.0	AA	45	0.1414	3.592	7	0.0943	2.395	24.0	107	938	1,470
795,000	...	402.8	AA	30	0.1628	4.135	19	0.0977	2.482	37.1	165	1,160	1,726
795,000	...	402.8	AA	54	0.1213	3.081	7	0.1213	3.081	27.8	124	980	1,459
795,000	...	402.8	AA	45	0.1329	3.376	7	0.0886	2.250	21.5	95.4	872	1,298
795,000	...	402.8	AA	26	0.1749	4.442	7	0.1360	3.454	30.5	136	1,041	1,549
795,000	...	402.8	AA	24	0.1820	4.623	7	0.1213	3.081	27.5	122	981	1,459
795,000	...	402.8	AA	36	0.1486	3.774	1	0.1486	3.774	16.6	73.8	795	1,182
715,000	...	362.3	AA	30	0.1544	3.922	19	0.0926	2.352	33.4	148	1,043	1,552
715,000	...	362.3	AA	26	0.1659	4.214	7	0.1290	3.277	27.5	122	936	1,393
715,000	...	362.3	AA	24	0.1727	4.387	7	0.1151	2.924	24.8	110	883	1,314
666,600	...	337.8	AA	26	0.1601	4.067	7	0.1245	3.162	26.0	116	872	1,298

Note : Class AA - For bare conductors usually used in overhead lines.

(Table 30)

Conductor Size (Al Wire)			Class	Stranding						Rated Strength		Linear Density	
CMILS	AWG	mm ²		Aluminum			Aluminum-clad Steel			kips (1000 lbf)	kN	lb/10000ft	kg/km
				No. of Wires	Nominal Dia.		No. of Wires	Nominal Dia.					
					in	mm		in	mm				
666,600	...	337.8	AA	24	0.1667	4.234	7	0.1111	2.822	23.1	103	823	1,224
636,000	...	322.3	AA	30	0.1456	3.698	19	0.0874	2.220	29.9	133	928	1,381
636,000	...	322.3	AA	30	0.1456	3.698	7	0.1456	3.698	29.3	130	935	1,391
636,000	...	322.3	AA	26	0.1564	3.973	7	0.1216	3.089	24.8	110	832	1,238
636,000	...	322.3	AA	24	0.1828	4.135	7	0.1085	2.756	22.0	98.0	785	1,168
636,000	...	322.3	AA	36	0.1329	3.376	1	0.1329	3.376	13.6	60.6	636	946
636,000	...	322.3	AA	18	0.1880	4.775	1	0.1880	4.775	15.0	66.8	676	1,005
605,000	...	306.6	AA	30	0.1420	3.607	19	0.0852	2.164	28.5	126.6	883	1,313
605,000	...	306.6	AA	30	0.1420	3.607	7	0.1420	3.607	28.4	126	889	1,323
605,000	...	306.6	AA	26	0.1525	3.873	7	0.1186	3.012	23.6	105	791	1,178
605,000	...	306.6	AA	24	0.1588	4.034	7	0.1059	2.690	21.0	93.3	747	1,111
556,500	...	282.0	AA	30	0.1362	3.459	7	0.1362	3.459	26.8	119	818	1,217
556,500	...	282.0	AA	26	0.1483	3.716	7	0.1138	2.891	21.9	97.5	728	1,084
556,500	...	282.0	AA	24	0.1523	3.868	7	0.1015	2.578	19.3	85.7	687	1,022
556,500	...	282.0	AA	18	0.1758	4.465	1	0.1758	4.465	13.2	58.9	591	879
477,000	...	241.7	AA	30	0.1261	3.203	7	0.1261	3.203	23.4	104	701	1,043
477,000	...	241.7	AA	26	0.1354	3.439	7	0.1053	2.675	18.9	84.3	624	928
477,000	...	241.7	AA	24	0.1410	3.581	7	0.0940	2.388	16.7	74.3	589	876
477,000	...	241.7	AA	18	0.1628	4.135	1	0.1628	4.135	11.5	51.0	507	754
397,500	...	201.4	AA	30	0.1151	2.924	7	0.1151	2.924	19.6	87.4	584	869
397,500	...	201.4	AA	26	0.1236	3.139	7	0.0961	2.441	15.8	70.2	520	773
397,500	...	201.4	AA	24	0.1287	3.269	7	0.0858	2.179	14.1	62.5	491	730
397,500	...	201.4	AA	18	0.1486	3.774	1	0.1486	3.774	9.78	43.5	422	628
336,400	...	170.5	AA	30	0.1059	2.690	7	0.1059	2.690	16.7	74.5	495	736
336,400	...	170.5	AA	26	0.1137	2.888	7	0.0884	2.245	13.5	60.0	440	654
336,400	...	170.5	AA	18	0.1367	3.472	1	0.1367	3.472	8.54	38.0	357	532
300,000	...	152.0	AA	26	0.1074	2.728	7	0.0835	2.121	12.1	54.0	392	584
266,800	...	135.2	AA	26	0.1013	2.573	7	0.0788	2.002	10.8	48.0	349	520
266,800	...	135.2	AA	18	0.1217	3.091	1	0.1217	3.091	6.82	30.3	283	421
211,600	0000	107.2	AA, A	6	0.1878	4.770	1	0.1878	4.770	7.69	34.2	277	411
211,300	0000	107.1	AA(+)	12	0.1327	3.371	7	0.1327	3.371	19.8	88.0	477	709
203,200	0000	103.0	AA(+)	16	0.1127	2.863	19	0.0977	2.482	27.1	120	601	894
190,800	0000	96.68	AA(+)	12	0.1261	3.203	7	0.1261	3.203	18.3	81.3	431	641
176,900	0000	89.64	AA(+)	12	0.1214	3.084	7	0.1214	3.084	16.9	75.4	399	594
167,800	000	85.02	AA, A	6	0.1672	4.247	1	0.1672	4.247	6.30	28.0	219	326
159,000	000	80.57	AA(+)	12	0.1151	2.924	7	0.1151	2.924	15.3	68.0	359	534

Notes : Class AA - For bare conductors usually used in overhead lines.
Class A - For conductors to be covered with weather-resistant materials.
(+): Indicates conductors with high strength to current capacity ratios.

(Table 30)

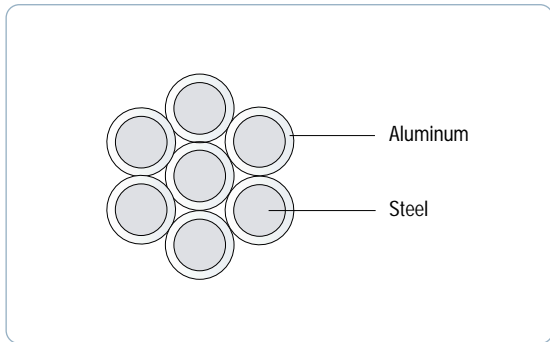
Conductor Size (Al Wire)			Class	Stranding						Rated Strength		Linear Density	
CMILS	AWG	mm ²		Aluminum			Aluminum-clad Steel			kips (1000 lbf)	kN	lb/10000ft	kg/km
				No. of Wires	Nominal Dia.		No. of Wires	Nominal Dia.					
					in	mm		in	mm				
152,500	000	77.27	AA(+)	5	0.1747	4.437	2	0.1747	4.437	9.66	43.0	281	418
141,300	000	71.60	AA(+)	4	0.1880	4.775	3	0.1880	4.775	14.2	62.9	373	555
134,600	000	68.20	AA(+)	12	0.1059	2.690	7	0.1059	2.690	13.0	57.8	304	452
133,100	00	67.44	AA,A	6	0.1489	3.782	1	0.1489	3.782	5.13	22.8	174	259
121,000	00	61.31	AA(+)	5	0.1556	3.952	2	0.1556	3.952	8.03	35.7	223	332
112,100	00	56.80	AA(+)	4	0.1674	4.252	3	0.1674	4.252	11.9	52.7	296	440
110,800	00	56.14	AA(+)	12	0.0961	2.441	7	0.0961	2.441	10.8	48.0	250	372
105,600	0	53.51	AA,A	6	0.1327	3.371	1	0.1327	3.371	4.25	18.9	138	205
101,800	0	51.58	AA(+)	12	0.0921	2.339	7	0.0921	2.339	9.91	44.1	230	342
99,830	0	50.58	AA(+)	3	0.1824	4.633	4	0.1824	4.633	16.4	72.7	395	588
95,910	0	48.60	AA(+)	5	0.1385	3.518	2	0.1385	3.518	6.58	29.3	177	263
88,840	0	45.02	AA(+)	4	0.1490	3.785	3	0.1490	3.785	9.68	43.0	234	348
83,690	1	42.41	AA,A	6	0.1181	3.000	1	0.1181	3.000	3.45	15.3	109	163
80,000	1	40.54	AA(+)	8	0.1000	2.540	1	0.1670	4.242	4.89	21.7	138	205
79,130	1	40.10	AA(+)	3	0.1624	4.125	4	0.1624	4.125	13.8	61.2	313	466
76,080	1	38.55	AA(+)	5	0.1234	3.134	2	0.1234	3.134	5.45	24.3	140	209
70,480	1	35.71	AA(+)	4	0.1327	3.371	3	0.1327	3.371	8.10	36.0	186	276
66,360	2	33.62	AA,A	7	0.0974	2.474	1	0.1299	3.299	3.51	15.6	100	149
66,360	2	33.62	AA,A	6	0.1052	2.672	1	0.1052	2.672	2.76	12.3	86.8	129
64,920	2	32.89	AA(+)	2	0.1802	4.577	5	0.1802	4.577	19.5	86.9	430	640
62,770	2	31.81	AA(+)	3	0.1446	3.673	4	0.1446	3.673	11.2	50.0	248	369
60,340	2	30.57	AA(+)	5	0.1099	2.791	2	0.1099	2.791	4.37	19.4	111	165
55,890	2	28.32	AA(+)	4	0.1182	3.002	3	0.1182	3.002	6.60	29.4	147	219
52,620	3	26.66	A	6	0.0937	2.380	1	0.0937	2.380	2.23	9.92	69	102
51,500	3	26.10	AA(+)	2	0.1605	4.077	5	0.1605	4.077	16.5	73.3	341	508
49,780	3	25.22	AA(+)	3	0.1288	3.272	4	0.1288	3.272	9.69	43.1	197	293
47,850	3	24.25	AA(+)	5	0.0978	2.484	2	0.0978	2.484	3.50	15.6	88.0	131
44,320	3	22.46	AA(+)	4	0.1053	2.675	3	0.1053	2.675	5.26	23.4	117	174
41,740	4	21.15	AA,A	7	0.0772	1.961	1	0.1029	2.614	2.28	10.1	62.7	93.3
41,740	4	21.15	AA,A	6	0.0834	2.118	1	0.0834	2.118	1.78	7.93	54.5	81.1
40,840	4	20.69	AA(+)	2	0.1429	3.630	5	0.1429	3.630	13.5	59.9	270	402
39,470	4	20.00	AA(+)	3	0.1147	2.913	4	0.1147	2.913	7.72	34.3	156	232
37,950	4	19.23	AA(+)	5	0.0871	2.212	2	0.0871	2.212	2.79	12.4	69.8	104
35,150	4	17.81	AA(+)	4	0.0937	2.380	3	0.0937	2.380	4.19	18.6	92.6	138
32,390	4	16.41	AA(+)	2	0.1273	3.233	5	0.1273	3.233	11.3	50.3	215	319
31,300	4	15.86	AA(+)	3	0.1022	2.596	4	0.1022	2.596	6.13	27.3	124	185
25,690	4	13.02	AA(+)	2	0.1133	2.878	5	0.1133	2.878	8.96	39.9	170	253

Notes : Class AA - For bare conductors usually used in overhead lines.

Class A - For conductors to be covered with weather-resistant materials.

(+) : Indicates conductors with high strength to current capacity ratios.

AWS Stranded Aluminum-clad Steel Conductor



Application

This standard covers stranded aluminum-clad steel conductors to be used mainly for overhead ground wire.

Construction

Stranded aluminum-clad steel conductor

Standards

Conforms to ASTM B 416-93

(Table 31)

No. and Size of Wires	No. and Dia. of Individual Wires		Nominal Dia. (in)	Min. Breaking Strength (lb)	Linear Density		Max. Resistance ($\Omega/1000ft, 20^\circ C$)	Nominal Cross Section	
	Number (No.)	Nominal Dia. (in)			lb/1000ft	lb/mile		CMILS	sq in
37 No. 5AWG	37	0.1819	1.27	142,800	2,802	14,800	0.04247	1,225,000	0.9619
37 No. 6AWG	37	0.1620	1.13	120,200	2,222	11,730	0.05356	971,300	0.7629
37 No. 7AWG	37	0.1443	1.01	100,700	1,762	9,305	0.06754	770,300	0.6050
37 No. 8AWG	37	0.1285	0.899	84,200	1,398	7,379	0.08516	610,900	0.4798
37 No. 9AWG	37	0.1144	0.801	66,770	1,108	5,852	0.1074	484,400	0.3805
37 No.10AWG	37	0.1019	0.713	52,950	879.0	4,641	0.1354	384,200	0.3017
19 No. 5AWG	19	0.1819	0.910	73,350	1,430	7,552	0.08224	628,900	0.4940
19 No. 6AWG	19	0.1620	0.810	61,700	1,134	5,990	0.1037	498,800	0.3917
19 No. 7AWG	19	0.1443	0.721	51,730	899.5	4,750	0.1308	395,500	0.3107
19 No. 8AWG	19	0.1285	0.642	43,240	713.5	3,767	0.1649	313,700	0.2464
19 No. 9AWG	19	0.1144	0.572	34,290	565.8	2,987	0.2079	248,800	0.1954
19 No.10AWG	19	0.1019	0.509	27,190	448.7	2,369	0.2622	197,300	0.1549
7 No. 5AWG	7	0.1819	0.546	27,030	524.9	2,772	0.2264	231,700	0.1820
7 No. 6AWG	7	0.1620	0.486	22,730	416.3	2,198	0.2803	183,800	0.1443
7 No. 7AWG	7	0.1443	0.433	19,060	330.0	1,743	0.3535	145,700	0.1145
7 No. 8AWG	7	0.1285	0.385	15,930	261.8	1,382	0.4458	115,600	0.09077
7 No. 9AWG	7	0.1144	0.343	12,630	207.6	1,096	0.5621	91,650	0.07198
7 No.10AWG	7	0.1019	0.306	10,020	164.7	869.4	0.7088	72,680	0.05708
7 No.11AWG	7	0.0907	0.272	7,945	130.6	689.4	0.8938	57,590	0.04523
7 No.12AWG	7	0.0808	0.242	6,301	103.6	546.8	1.127	45,710	0.03590
3 No. 5AWG	3	0.1819	0.392	12,230	224.5	1,186.0	0.5177	99,310	0.07800
3 No. 6AWG	3	0.1620	0.349	10,280	178.1	940.2	0.6528	78,750	0.06185
3 No. 7AWG	3	0.1443	0.311	8,621	141.2	745.6	0.8232	62,450	0.04905
3 No. 8AWG	3	0.1285	0.277	7,206	112.0	591.3	1.038	49,530	0.03890
3 No. 9AWG	3	0.1144	0.247	5,715	88.81	468.9	1.309	39,280	0.03085
3 No.10AWG	3	0.1019	0.220	4,532	70.43	371.8	1.651	31,150	0.02446

Coefficient of linear expansion 0.0000072/°F 0.0000126/°C
 Final modulus of elasticity 23,000,000psi(160GPa)
 Temperature coefficient of resistance 0.0020/°F 0.0036/°C
 Conductivity 20.3%

KS • JIS • KEPCO • TEC
 ASTM • ANSI
 IEC
 BS • AS • CSA • DIN

AL-ALLOY Hard-drawn Aluminum Wires for Electric Purposes



Application

This standard covers aluminum-alloy (hard: solution, heat-treated, cold worked, and artificially aged) round wires for electrical purposes to be used mainly as component wires of Al-alloy stranded cables and Al-alloy cables steel reinforced.

Construction

Single aluminum-alloy conductor

Standards

Conforms to ASTM B 398-97

Tensile Requirements

(Table 32)

Diameter		Tolerance on Dia. (±%, or in)	Min. Tensile Strength				Min. Elongation in 10 in or 250mm
in	mm		Average for a Lot		Individual Tests		Individual Tests (%)
			ksi	MPa	ksi	MPa	
0.1878 to 0.1328	4.770 to 3.373	1%	46	317	44	303	3.0
0.1327 to 0.0612	3.371 to 1.554	0.0010 in	48	331	46	317	3.0

Equivalent Resistivity Values at 20°C(68°F)

(Table 33)

Material	Volume Conductivity (% IACS)	Resistivity Constants			
		Volume			
		$\Omega \cdot \text{cmil/ft}$	$\Omega \cdot \text{mm}^2/\text{m}$	$\mu\Omega \cdot \text{in}$	$\mu\Omega \cdot \text{cm}$
Copper	100	10.371	0.017241	0.67879	1.7241
Aluminum	61.0	17.002	0.028265	1.1128	2.8265
Aluminum	53.5	19.385	0.032227	1.2687	3.2227
Aluminum	52.5	19.755	0.32841	1.2929	3.2841

AAAC Stranded Aluminum-alloy 6201-T81 Conductors



Application

This standard covers stranded aluminum-alloy 6201-T81 conductors which could high tensile load to be used mainly for overhead distribution wire.

Construction

Stranded aluminum-alloy conductor

Standards

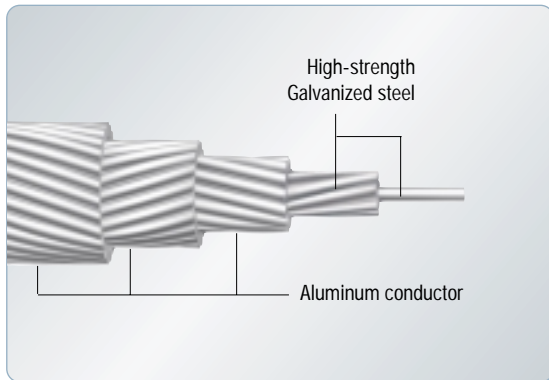
Conforms to ASTM B 399-97

(Table 34)

Code Word	Conductor Size		Approx. Aluminum 1350 Size having Equivalent Resistance			Size and Stranding of ACSR with Equal Dia.				Required Construction			Weight		Rated Strength		Resistance (at 1000ft, 20 °C)	
	CMILS	mm ²	Size			CMILS ^A	AWG	mm ²	Strand-ing	No. of Wires	Dia. of Wires		Class	lb/1000ft	kg/km	kips		kN
			CMILS ^A	AWG	mm ²						in	mm						
-	1,439,200	729.2	1,272,000	...	644.5	1,272,000	...	644.5	54/7	61	0.1536	3.90	AA	1,342	1,997	46.8	208	0.0140
-	1,348,800	683.4	1,192,500	...	604.2	1,192,500	...	604.2	54/7	61	0.1487	3.78	AA	1,258	1,872	43.9	195	0.0149
-	1,259,600	638.2	1,113,000	...	564.0	1,113,000	...	564.0	54/7	61	0.1437	3.65	AA	1,175	1,748	41.0	182	0.0160
-	1,165,100	590.3	1,033,500	...	523.7	1,033,500	...	523.7	54/7	61	0.1382	3.51	AA	1,086	1,617	37.9	169	0.0173
-	1,077,400	545.9	954,000	...	483.4	954,000	...	483.4	54/7	61	0.1329	3.38	AA	1,005	1,495	35.0	156	0.0187
Greely	927,200	469.8	795,000	...	402.8	795,000	...	402.8	26/7	37	0.1583	4.02	AA	864.6	1,287	30.5	136	0.0217
Flint	740,800	375.4	636,000	...	322.3	636,000	...	322.3	26/7	37	0.1415	3.59	AA	690.8	1,028	24.4	108	0.0272
Elgin	652,400	330.6	556,500	...	282.0	556,500	...	282.0	26/7	19	0.1853	4.71	AA	608.3	905.2	21.9	97.5	0.0309
Darien	559,500	283.5	477,000	...	241.7	477,000	...	241.7	26/7	19	0.1716	4.36	AA	521.7	776.3	18.8	83.6	0.0360
Cairo	465,400	235.8	397,500	...	201.4	397,500	...	201.4	26/7	19	0.1565	3.98	AA	433.9	645.7	15.6	69.6	0.0433
Canton	394,500	199.9	336,400	...	170.5	336,400	...	170.5	26/7	19	0.1441	3.66	AA, A	367.9	547.4	13.3	59.0	0.0511
Butte	312,800	158.5	266,800	...	135.2	266,800	...	135.2	26/7	19	0.1283	3.26	A	291.6	434.0	11.0	48.8	0.0644
Alliance	246,900	125.1	211,600	0000	107.2	211,600	0000	107.2	6/1	7	0.1878	4.77	AA	230.2	342.6	8.56	38.1	0.0816
Amherst	195,700	99.2	167,800	000	85.0	167,800	000	85.0	6/1	7	0.1672	4.25	AA, A	182.5	271.5	6.79	30.2	0.103
Anaheim	155,400	78.7	133,100	00	67.4	133,100	00	67.4	6/1	7	0.1490	3.78	AA, A	144.9	215.6	5.39	24.0	0.130
Azusa	123,300	62.5	105,600	0	53.5	105,600	0	53.5	6/1	7	0.1327	3.37	AA, A	114.9	171.0	4.46	19.8	0.163
Ames	77,470	39.3	66,360	2	33.6	66,360	2	33.6	6/1	7	0.1052	2.67	AA, A	72.24	107.5	2.80	12.5	0.260
Alton	48,690	24.7	41,740	4	21.1	41,740	4	21.1	6/1	7	0.0834	2.12	A	45.40	67.56	1.76	7.84	0.414
Akron	30,580	15.5	26,240	6	13.3	26,240	6	13.3	6/1	7	0.0661	1.68	A	28.52	42.44	1.11	4.92	0.659

Notes : Class AA - For bare conductors usually used in overhead lines.
Class A - For conductors to be covered with weather-resistant materials.

H.S-ACSR High-strength Zinc-coated Steel Core Wire for Aluminum and Aluminum-alloy Conductors, Steel Reinforced



Application

This standard covers round, high-strength, zinc-coated, steel core wire with class A zinc coating used for mechanical reinforcement in the manufacture of special Al and Al-alloy conductors, steel reinforced.

Construction

The center wire or wires are of high-strength galvanized steel and the outer layer or layers of special aluminum.

Standards

Conforms to ASTM B 606-93

(Table 35)

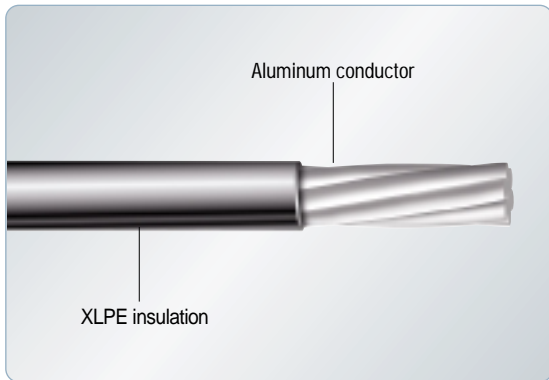
Code Word	ACSR			Copper Equivalent (MCM or AWG)	No. and Dia. of Strands (in)		Diameter (in)	
	Cross Section		Total sq in		Al	St	Complete Conductor	Steel Core
	Aluminum	Total						
MCM or AWG	sq in	sq in						
Grouse	80	0.0628	0.0847	50.31	8 × 0.1000	1 × 0.1670	0.367	0.1670
Petrel	101.8	0.0800	0.1266	64.16	12 × 0.0921	7 × 0.0921	0.461	0.2763
Minorca	110.8	0.0870	0.1378	69.7	12 × 0.0961	7 × 0.0961	0.481	0.2883
Leghorn	134.6	0.1057	0.1674	84.6	12 × 0.1059	7 × 0.1059	0.530	0.3177
Guinea	159	0.1249	0.1977	100	12 × 0.1151	7 × 0.1151	0.576	0.3453
Dotterel	176.9	0.1389	0.2199	111.2	12 × 0.1214	7 × 0.1214	0.607	0.3642
Dorking	190.8	0.1499	0.2373	120.0	12 × 0.1261	7 × 0.1261	0.631	0.3783
Brahma	203.2	0.1596	0.3020	127.8	16 × 0.1127	19 × 0.0977	0.714	0.4885
Cochin	211.3	0.1660	0.2628	132.9	12 × 0.1327	7 × 0.1327	0.664	0.3981

Note : The above sizes are those commonly used.

(Table 36)

Code Word	Weight(pound)				Total Weight (%)		Ultimate Strength (pound)			Calculated Resistance at 20°C (68°F) (Ω/1000ft)
	Per 1000ft		Per mile		Al	St	Zinc-coated Core			
	Al	Total	Al	Total			Standard Weight Coating	Class B Coating	Class C Coating	
Grouse	75.1	149.0	397	787	50.4	49.6	5,200	4,655	4,550	0.217
Petrel	96.0	254.1	507	1,342	37.8	62.2	9,860	9,615	9,385	0.171
Minorca	104.5	276.6	552	1,640	37.8	62.2	10,730	10,480	10,220	0.157
Leghorn	127.0	336.0	671	1,774	37.8	62.2	12,920	12,620	12,310	0.129
Guinea	150.0	396.8	792	2,095	37.8	62.2	15,200	14,850	14,880	0.110
Dotterel	166.9	441.5	881	2,331	37.8	62.2	16,400	15,640	14,830	0.0985
Dorking	180.0	476.3	950	2,525	37.8	62.2	17,730	16,860	16,000	0.0913
Brahma	191.7	676.6	1,012	3,573	28.3	71.7	27,500	26,800	26,100	0.0723
Cochin	199.3	527.5	1,052	2,785	37.8	62.2	19,640	18,700	17,700	0.0825

HAL-OC “EC” Grade Aluminum Conductor Constructions, Weather-resistant Wire and Cable



Application

This standard covers HAL-OC (for use in 6,600 volts circuits) to be used as weather-resistant wire and cable for the distribution of electrical energy under the normal conditions of overhead line service.

Construction

Solid or stranded hard-drawn aluminum conductor and polyethylene cross linked polyethylene insulation

Standards

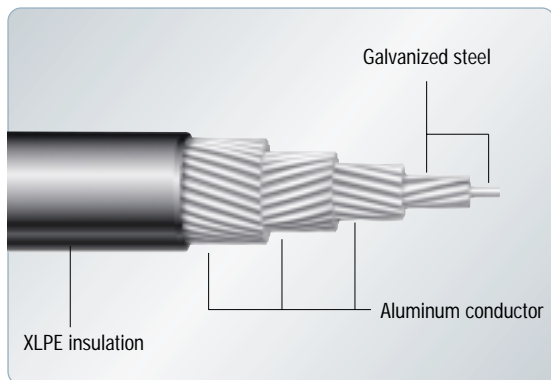
Conforms to ANSI C 8.35-1975, ICEA S-70-547

(Table 37)

*Code Word	Conductor			No. of Wires	Covering Thickness	
	AWG or MCM	Cross Sectional Area			mils	mm
		CMILS	mm ²			
Cumquat	8	16,510	8.367	Solid	30	0.76
Apple	6	26,240	13.30	Solid	30	0.76
Plum	6	26,240	13.30	7	30	0.76
Pear	4	41,740	21.15	Solid	30	0.76
Apricot	4	41,740	21.15	7	30	0.76
Cherry	2	66,360	33.62	Solid	45	1.14
Peach	2	66,360	33.62	7	45	1.14
Nectarine	1	83,690	42.41	7	45	1.14
Quince	1/0	105,600	53.49	7	60	1.52
Haw	1/0	105,600	53.49	19	60	1.52
Orange	2/0	133,100	67.43	7	60	1.52
Ironwood	2/0	133,100	67.43	19	60	1.52
Fig	3/0	167,800	85.01	7	60	1.52
Lemon	3/0	167,800	85.01	19	60	1.52
Olive	4/0	211,600	107.2	7	60	1.52
Pomegranate	4/0	211,600	107.2	19	60	1.52
Sassafras	250		127	19	60	1.52
Catalpa	250		127	19	75	1.90
Mulberry	266.8		135	19	60	1.52
Silverbelt	266.8		135	19	75	1.90
Basswood	300		152	19	60	1.52
Sycamore	300		152	19	75	1.90
Anona	336.4		170	19	60	1.52
Crabapple	336.4		170	19	75	1.90
Chinquapin	350		177	19	60	1.52
Ginkgo	350		177	19	75	1.90
Molles	397.5		201	19	75	1.90
Ash	400		203	19	75	1.90
Sumac	450		228	37	75	1.90
Huckleberry	477		242	37	75	1.90
Tupelo	500		253	37	75	1.90
Paw Paw	556		282	37	75	1.90
Tangerine	636		322	37	95	2.41
Breadfruit	636		322	61	95	2.41
Persimmon	795		403	61	95	2.41
Grapefruit	1,033.5		523	61	95	2.41
Mango	1,590		806	61	110	2.79

*Add "HD" to code word to designate high-density polyethylene covering, or "XLPE" to designate cross-linked thermosetting polyethylene covering.

ACSR/OC Aluminum, Steel-reinforced(ACSR) Conductor Weather-resistant Insulation Wires



Application

This standard covers ACSR-OC (for use in 6,600 volts circuits) to be used as weather-resistant cable for the distribution of electrical energy under the normal conditions of overhead line service.

Construction

Aluminum, steel-reinforced conductor and polyethylene or cross-linked polyethylene insulation

Standards

Conforms to ANSI C 8.35-1975, ICEA S-70-547

(Table 38)

* Code Word	Conductor			Strands Al/St	Covering Thickness	
	AWG or MCM	Aluminum Cross Sectional Area			mils	mm
		CMILS	mm ²			
Walnut	6	26,240	13.30	6/1	30	0.76
Acorn	5	33,090	16.77	6/1	30	0.76
Butternut	4	41,740	21.15	6/1	30	0.76
Hickory	4	41,740	21.15	7/1	30	0.76
Hazelnut	3	52,620	26.67	6/1	45	1.14
Pignut	2	66,360	33.62	6/1	45	1.14
Beech	2	66,360	33.62	7/1	45	1.14
Chestnut	1	83,690	42.41	6/1	45	1.14
Almond	1/0	105,600	53.49	6/1	60	1.52
Pecan	2/0	133,100	67.43	6/1	60	1.52
Cottonwood	2/0	133,100	67.43	6/1	75	1.90
Filbert	3/0	167,800	85.01	6/1	60	1.52
Chokeberry	3/0	167,800	85.01	6/1	75	1.90
Buckeye	4/0	211,600	107.2	6/1	60	1.52
Gumwood	4/0	211,600	107.2	6/1	75	1.90
Hackberry	266.8		135	18/1	60	1.52
Redbud	266.8		135	18/1	75	1.90
Mockernut	336.4		170	18/1	60	1.52
Aspen	336.4		170	18/1	75	1.90

*Add "HD" to code word to designate high-density polyethylene covering, or "XLPE" to designate cross-linked thermosetting polyolefin covering.

Electrical Conductors, Covered Line Wire and Multiplex Types

Weather-resistant Line Wire

KS • JIS • KEPCO • TEC
 ASTM • ANSI
 IEC
 BS • AS • CSA • DIN

POLYETHYLENE TYPE

Code Word	CMILS or AWG	Stranding	Cover Thickness 64th (in)	Nominal Weight (pound/1000ft)		Length per Reel (ft)
				Al	Total	

Solid Aluminum Conductor (Table 39)

Apple	6	1	2	24.2	31.7	12,000
Pear	4	1	2	38.4	48.0	8,500
Cherry	2	1	3	61.1	79.2	5,000

Stranded Aluminum Conductor (Table 40)

Plum	6	7	2	24.6	35.0	9,400
Apricot	4	7	2	39.2	53.3	7,000
Peach	2	7	3	62.3	87.4	7,500
Nectarine	1	7	3	78.5	107.0	6,000
Quince	1/0	7	4	99.1	140.0	4,700
Orange	2/0	7	4	124.9	172.0	3,750
Fig	3/0	7	4	157.5	211.0	4,400
Olive	4/0	7	4	198.6	260.0	3,500
Pomegranate	4/0	19	4	198.6	255.0	3,800
Mulberry	266,800	19	4	250.4	315.0	3,000
Anona	336,400	19	4	315.8	390.0	2,400
Crabapple	336,400	19	5	315.8	404.0	2,000
Molles	397,500	19	5	372.5	471.0	2,000
Huckleberry	477,000	37	5	447.8	550.0	3,300
Paw Paw	556,500	37	5	522.4	635.0	2,800
Braedfruit	636,000	61	6	597.0	740.0	2,500
Persimmon	795,000	61	6	746.3	900.0	2,200
Grapefruit	1,033,500	61	6	970.1	1,150.0	1,700

ACSR (Table 41)

Walnut	6	6/1	2	24.5	47.5	8,000
Butternut	4	6/1	2	39.0	72.0	5,100
Hickory	4	7/1	2	39.0	82.0	6,000
Pignut	2	6/1	3	62.0	119.0	6,400
Beech	2	7/1	3	62.0	135.0	5,600
Chestnut	1	6/1	3	78.2	146.0	5,100
Almond	1/0	6/1	4	98.6	191.0	4,000
Pecan	2/0	6/1	4	124.3	235.0	3,200
Filbert	3/0	6/1	4	156.8	290.0	3,800
Buckeye	4/0	6/1	4	197.7	359.0	3,000
Hackberry	266,800	18/1	4	250.4	357.0	2,400

CROSS-LINKED POLYETHYLENE(XLPE) TYPE

Code Word	CMILS or AWG	Stranding	Cover Thickness 64th (in)	Nominal Weight (pound/1000ft)		Length per Reel (ft)
				Al	Total	

Solid Aluminum Conductor (Table 42)

Apple/XLPE	6	1	2	24.2	34	12,000
Pear/XLPE	4	1	2	38.4	50	8,500
Cherry/XLPE	2	1	3	61.1	83	5,000

Stranded Aluminum Conductor (Table 43)

Plum/XLPE	6	7	2	24.6	37	9,400
Apricot/XLPE	4	7	2	39.2	55	7,000
Peach/XLPE	2	7	3	62.3	93	7,500
Nectarine/XLPE	1	7	3	78.5	113	6,000
Quince/XLPE	1/0	7	4	99.1	150	4,700
Orange/XLPE	2/0	7	4	124.9	183	3,750
Fig/XLPE	3/0	7	4	157.5	223	4,400
Olive/XLPE	4/0	7	4	198.6	274	3,500
Pomegranate/XLPE	4/0	19	4	198.6	266	3,800

Note : Items shown in colored type are normally used.

Electrical Conductors, Covered Line Wire and Multiplex Types Self-supporting Secondary and Service Drop Cable

POLYETHYLENE DUPLEX TYPE

Code Word	Phase Conductors			Bare Neutral Messenger		Nominal Weight (lb/1000ft)		Length per Reel (ft)
	AWG	Stranding	Insulation Thickness 64th	AWG	Stranding	Al	Total	

All-aluminum Neutral Messenger (Table 44)

Pekingese	6	1	3	6	7	49	63	3,000
Collie	6	7	3	6	7	49	66	2,800
Dachshund	4	1	3	4	7	78	95	2,200
Spaniel	4	7	3	4	7	78	100	2,000
Doberman	2	7	3	2	7	125	152	2,400
Malemute	1/0	19	4	1/0	7	198	244	1,500

ACSR Neutral Messenger (Table 45)

Setter	6	1	3	6	6/1	49	75	3,000
Shepherd	6	7	3	6	6/1	49	78	2,800
Eskimo	4	1	3	4	6/1	77	114	2,200
Terrier	4	7	3	4	6/1	78	118	2,000
Chow	2	7	3	2	6/1	124	181	2,400
Bull	1/0	19	4	1/0	6/1	198	289	1,500

CROSS-LINKED POLYETHYLENE(XLPE) DUPLEX TYPE

Code Word	Phase Conductors			Bare Neutral Messenger		Nominal Weight (lb/1000ft)		Length per Reel (ft)
	AWG	Stranding	Insulation Thickness 64th	AWG	Stranding	Al	Total	

All-aluminum Neutral Messenger (Table 46)

Pekingese/XLPE	6	1	3	6	7	49	64	3,000
Collie/XLPE	6	7	3	6	7	49	68	2,800
Dachshund/XLPE	4	1	3	4	7	78	96	2,200
Spaniel/XLPE	4	7	3	4	7	78	103	2,000
Doberman/XLPE	2	7	3	2	7	125	156	2,400
Malemute/XLPE	1/0	19	4	1/0	7	198	246	1,500

ACSR Neutral Messenger (Table 47)

Setter/XLPE	6	1	3	6	6/1	49	75	3,000
Shepherd/XLPE	6	7	3	6	6/1	49	80	2,800
Eskimo/XLPE	4	1	3	4	6/1	77	114	2,200
Terrier/XLPE	4	7	3	4	6/1	78	121	2,000
Chow/XLPE	2	7	3	2	6/1	124	185	2,400
Bull/XLPE	1/0	19	4	1/0	6/1	198	282	1,500

Note : Items shown in colored type are normally used.

Electrical Conductors, Covered Line Wire and Multiplex Types Self-supporting Secondary and Service Drop Cable

POLYETHYLENE TRIPLEX TYPE

Code Word	Phase Conductors			Bare Neutral Messenger		Nominal Weight (lb/1000ft)		Length per Reel (ft)
	AWG	Stranding	Insulation Thickness 64th	AWG	Stranding	Al	Total	
All-aluminum Neutral Messenger (Table 48)								
Haiotis	6	1	3	6	7	73	100	2,500
Fusus	4	1	3	4	7	116	151	1,700
Oyster	4	7	3	4	7	118	161	1,500
Clam	2	7	3	2	7	187	240	1,800
Murex	1/0	7	4	1/0	7	297	395	1,200
Purpura	1/0	19	4	1/0	7	297	390	1,200
Nassa	2/0	7	4	2/0	7	375	486	1,500
Trophon	2/0	19	4	2/0	7	375	478	1,500
Melita	3/0	19	4	3/0	19	473	583	1,300
Portunus	4/0	19	4	4/0	19	596	722	1,000

ACSR Neutral Messenger (Table 49)

Paludina	6	1	3	6	6/1	73	112	2,500
Voluta	6	7	3	6	6/1	74	120	2,000
Whelk	4	1	3	4	6/1	116	170	1,700
Periwinkle	4	7	3	4	6/1	118	180	1,500
Conch	2	7	3	2	6/1	187	270	1,800
Neritina	1/0	7	4	1/0	6/1	297	431	1,200
Cenia	1/0	19	4	1/0	6/1	297	426	1,200
Runcina	2/0	7	4	2/0	6/1	374	544	1,500
Triton	2/0	19	4	2/0	6/1	374	536	1,500
Mursia	3/0	19	4	3/0	6/1	472	657	1,300
Zuzara	4/0	19	4	4/0	6/1	596	814	1,000

CROSS-LINKED POLYETHYLENE(XLPE) TRIPLEX TYPE

Code Word	Phase Conductors			Bare Neutral Messenger		Nominal Weight (lb/1000ft)		Length per Reel (ft)
	AWG	Stranding	Insulation Thickness 64th	AWG	Stranding	Al	Total	
All-aluminum Neutral Messenger (Table 50)								
Haiotis/XLPE	6	1	3	6	7	73	103	2,500
Fusus/XLPE	4	1	3	4	7	116	154	1,700
Oyster/XLPE	4	7	3	4	7	118	166	1,500
Clam/XLPE	2	7	3	2	7	187	249	1,800
Murex/XLPE	1/0	7	4	1/0	7	297	400	1,200
Purpura/XLPE	1/0	19	4	1/0	7	297	393	1,200
Nassa/XLPE	2/0	7	4	2/0	7	375	480	1,500
Trophon/XLPE	2/0	19	4	2/0	7	375	483	1,500
Melita/XLPE	3/0	19	4	3/0	19	473	595	1,300
Portunus/XLPE	4/0	19	4	4/0	19	596	734	1,000

ACSR Neutral Messenger (Table 51)

Paludina/XLPE	6	1	3	6	6/1	73	115	2,500
Voluta/XLPE	6	7	3	6	6/1	74	124	2,000
Whelk/XLPE	4	1	3	4	6/1	116	172	1,700
Periwinkle/XLPE	4	7	3	4	6/1	118	184	1,500
Conch/XLPE	2	7	3	2	6/1	187	278	1,800
Neritina/XLPE	1/0	7	4	1/0	6/1	297	446	1,200
Cenia/XLPE	1/0	19	4	1/0	6/1	297	439	1,200
Runcina/XLPE	2/0	7	4	2/0	6/1	374	498	1,500
Triton/XLPE	2/0	19	4	2/0	6/1	374	541	1,500
Mursia/XLPE	3/0	19	4	3/0	6/1	472	668	1,300
Zuzara/XLPE	4/0	19	4	4/0	6/1	596	827	1,000

Electrical Conductors, Covered Line Wire and Multiplex Types Self-supporting Secondary and Service Drop Cable

*POLYETHYLENE QUADRUPLEX TYPE

Code Word	Phase Conductors			Bare Neutral Messenger		Nominal Weight (lb/1000ft)		Length per Reel (ft)
	AWG	Stranding	Insulation Thickness 64th	AWG	Stranding	Al	Total	
All-aluminum Neutral Messenger (Table 52)								
Clydesdale	4	1	3	4	7	154	207	1,700
Pinto	4	7	3	4	7	157	220	1,500
Mustang	2	7	3	2	7	249	330	1,800
Criollo	1/0	19	4	1/0	7	396	535	1,100
Percheron	2/0	19	4	2/0	7	500	655	1,500
Hanoverion	3/0	19	4	3/0	19	630	806	1,300
Oldenburg	4/0	19	4	4/0	19	795	993	1,000

ACSR Neutral Messenger (Table 53)								
Morochuca	6	1	3	6	6/1	97	151	2,500
Chola	6	7	3	6	6/1	98	163	2,000
Morgan	4	1	3	4	6/1	154	225	1,700
Hackney	4	7	3	4	6/1	157	245	1,500
Palomino	2	7	3	2	6/1	249	370	1,800
Costena	1/0	19	4	1/0	6/1	396	580	1,100
Grullo	2/0	19	4	2/0	6/1	499	715	1,500
Suffolk	3/0	19	4	3/0	6/1	629	879	1,300
Appaloosa	4/0	19	4	4/0	6/1	794	1,087	1,000

*CROSS-LINKED POLYETHYLENE(XLPE) QUADRUPLEX TYPE

Code Word	Phase Conductors			Bare Neutral Messenger		Nominal Weight (lb/1000ft)		Length per Reel (ft)
	AWG	Stranding	Insulation Thickness 64th	AWG	Stranding	Al	Total	
All-aluminum Neutral Messenger (Table 54)								
Clydesdale/XLPE	4	1	3	4	7	154	202	1,700
Pinto/XLPE	4	7	3	4	7	157	219	1,500
Mustang/XLPE	2	7	3	2	7	249	329	1,800
Criollo/XLPE	1/0	19	4	1/0	7	396	521	1,100
Percheron/XLPE	2/0	19	4	2/0	7	500	641	1,500
Hanoverion/XLPE	3/0	19	4	3/0	19	630	791	1,300
Oldenburg/XLPE	4/0	19	4	4/0	19	795	977	1,000

ACSR Neutral Messenger (Table 55)								
Morochuca/XLPE	6	1	3	6	6/1	97	148	2,500
Chola/XLPE	6	7	3	6	6/1	98	159	2,000
Morgan/XLPE	4	1	3	4	6/1	154	221	1,700
Hackney/XLPE	4	7	3	4	6/1	157	238	1,500
Palomino/XLPE	2	7	3	2	6/1	249	359	1,800
Costena/XLPE	1/0	19	4	1/0	6/1	396	568	1,100
Grullo/XLPE	2/0	19	4	2/0	6/1	499	700	1,500
Suffolk/XLPE	3/0	19	4	3/0	6/1	629	864	1,300
Appaloosa/XLPE	4/0	19	4	4/0	6/1	794	1,070	1,000

*One phase wire identified with ridges.



OVERHEAD ELECTRICAL

ALUMINUM CONDUCTORS

International Electrotechnical Commission

IEC

AAC Stranded Hard-drawn Aluminum Conductor



Application

This standard covers stranded hard-drawn circular aluminum conductors to be used mainly for overhead distribution wires, overhead feeder.

Construction

Stranded hard-drawn aluminum conductors

Standards

Conforms to IEC 1089-91

(Table 56)

Code Number (No.)	Area (mm ²)	No. of Wires (No.)	Diameter (mm)		Linear Mass (kg/km)	Rated Strength (kN)	D.C. Resistance (Ω/km)
			Wire	Conductor			
10	10	7	1.35	4.05	27.4	1.95	2.8633
16	16	7	1.71	5.12	43.8	3.04	1.7896
25	25	7	2.13	6.40	68.4	4.50	1.1453
40	40	7	2.70	8.09	109.4	6.80	0.7158
63	63	7	3.39	10.2	172.3	10.39	0.4545
100	100	19	2.59	12.9	274.8	17.00	0.2877
125	125	19	2.89	14.5	343.6	21.25	0.2302
160	160	19	3.27	16.4	439.8	26.40	0.1798
200	200	19	3.66	18.3	549.7	32.00	0.1439
250	250	19	4.09	20.5	687.1	40.00	0.1151
315	315	37	3.29	23.0	867.9	51.97	0.0916
400	400	37	3.71	26.0	1,102.0	64.00	0.0721
450	450	37	3.94	27.5	1,239.8	72.00	0.0641
500	500	37	4.15	29.0	1,377.6	80.00	0.0577
560	560	37	4.39	30.7	1,542.9	89.60	0.0515
630	630	61	3.63	32.6	1,738.3	100.80	0.0458
710	710	61	3.85	34.6	1,959.1	113.60	0.0407
800	800	61	4.09	36.8	2,207.4	128.00	0.0361
900	900	61	4.33	39.0	2,483.3	144.00	0.0321
1,000	1,000	61	4.57	41.1	2,759.2	160.00	0.0289
1,120	1,120	91	3.96	43.5	3,093.5	179.20	0.0258
1,250	1,250	91	4.18	46.0	3,452.6	200.00	0.0231
1,400	1,400	91	4.43	48.7	3,866.9	224.00	0.0207
1,500	1,500	91	4.58	50.4	4,143.1	240.00	0.0193

AAAC Stranded Aluminum-alloy Conductors



Application

This standard covers stranded aluminum-alloy conductors of the aluminum-magnesium-silicon type which could high tensile load to be used mainly for overhead distribution wires.

Construction

Stranded aluminum-alloy conductor

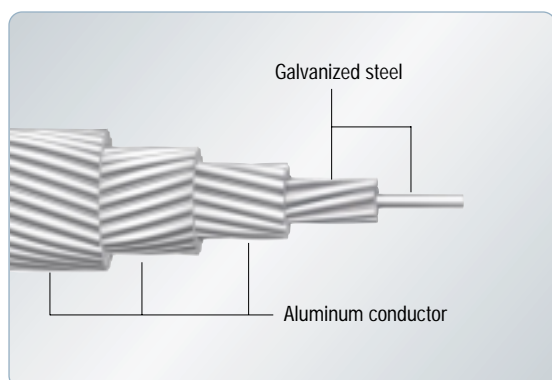
Standards

Conforms to IEC 1089-91

(Table 57)

Code Number (No.)	Area (mm ²)	No. of Wires (No.)	Diameter (mm)		Linear Mass (kg/km)	Rated Strength (kN)	D.C. Resistance (Ω/km)
			Wire	Conductor			
16	18.6	7	1.84	5.52	50.8	6.04	1.7896
25	29.0	7	2.30	6.90	79.5	9.44	1.1453
40	46.5	7	2.91	8.72	127.1	15.10	0.7158
63	73.2	7	3.65	10.9	200.2	23.06	0.4545
100	116	19	2.79	14.0	319.3	37.76	0.2877
125	145	19	3.12	15.6	399.2	47.20	0.2302
160	186	19	3.53	17.6	511.0	58.56	0.1798
200	232	19	3.95	19.7	638.7	73.20	0.1439
250	290	19	4.41	22.1	798.4	91.50	0.1151
315	366	37	3.55	24.8	1,008.4	115.29	0.0916
400	465	37	4.00	28.0	1,280.5	146.40	0.0721
450	523	37	4.24	29.7	1,440.5	164.70	0.0641
500	581	37	4.47	31.3	1,600.6	183.00	0.0577
560	651	61	3.69	33.2	1,795.3	204.96	0.0516
630	732	61	3.91	35.2	2,019.8	230.58	0.0458
710	825	61	4.15	37.3	2,276.2	259.86	0.0407
800	930	61	4.40	39.6	2,564.8	292.80	0.0361
900	1,046	91	3.83	42.1	2,888.3	329.40	0.0321
1,000	1,162	91	4.03	44.4	3,209.3	366.00	0.0289
1,120	1,301	91	4.27	46.9	3,594.4	409.92	0.0258

ACSR Aluminum Conductors, Steel Reinforced



Application

This standard covers aluminum stranded conductors steel reinforced which could withstand high tensile load to be used mainly for overhead transmission lines, overhead distribution lines.

Construction

The center wire or wires are of steel and the outer layer or layers of aluminum.

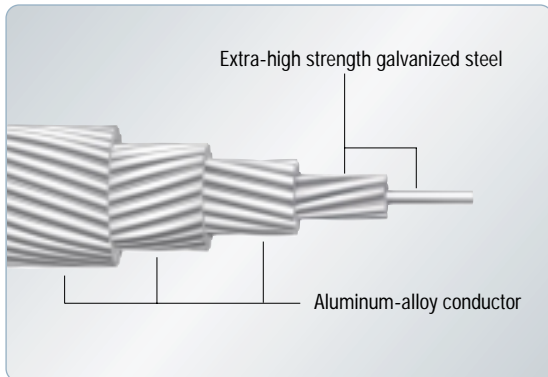
Standards

Conforms to IEC 1089-91

(Table 58)

Code Number (No.)	Steel Ratio (%)	Areas (mm ²)			No. of Wires (No.)		Wire Dia. (mm)		Diameter (mm)		Linear Mass (kg/km)	Rated Strength (kN)	D.C. Resistance (Ω /km)
		Al	St	Total	Al	St	Al	St	Core	Conductor			
16	17	16	2.67	18.7	6	1	1.84	1.84	1.84	5.53	64.6	6.08	1.7934
25	17	25	4.17	29.2	6	1	2.30	2.30	2.30	6.91	100.9	9.13	1.1478
40	17	40	6.67	46.7	6	1	2.91	2.91	2.91	8.74	161.5	14.40	0.7174
63	17	63	10.5	73.5	6	1	3.66	3.66	3.66	11.0	254.4	21.63	0.4555
100	17	100	16.7	117	6	1	4.61	4.61	4.61	13.8	403.8	34.33	0.2869
125	6	125	6.94	132	18	1	2.97	2.97	2.97	14.9	397.9	29.17	0.2304
125	16	125	20.4	145	26	7	2.47	1.92	5.77	15.7	503.9	45.69	0.2310
160	6	160	8.89	169	18	1	3.36	3.36	3.36	16.8	509.3	36.18	0.1800
160	16	160	26.1	186	26	7	2.80	2.18	6.53	17.7	644.9	57.69	0.1805
200	6	200	11.1	211	18	1	3.76	3.76	3.76	18.8	636.7	44.22	0.1440
200	16	200	32.6	233	26	7	3.13	2.43	7.30	19.8	806.2	70.13	0.1444
250	10	250	24.6	275	22	7	3.80	2.11	6.34	21.6	880.6	68.72	0.1154
250	16	250	40.7	291	26	7	3.50	2.72	8.16	22.2	1,007.7	87.67	0.1155
315	7	315	21.8	337	45	7	2.99	1.99	5.97	23.9	1,039.6	79.03	0.0917
315	16	315	51.3	366	26	7	3.93	3.05	9.16	24.9	1,269.7	106.83	0.0917
400	7	400	27.7	428	45	7	3.36	2.24	6.73	26.9	1,320.1	98.36	0.0722
400	13	400	51.9	452	54	7	3.07	3.07	9.21	27.6	1,510.3	123.04	0.0723
450	7	450	31.1	481	45	7	3.57	2.38	7.14	28.5	1,485.2	107.47	0.0642
450	13	450	58.3	508	54	7	3.26	3.26	9.77	29.3	1,699.1	138.42	0.0643
500	7	500	34.6	535	45	7	3.76	2.51	7.52	30.1	1,650.2	119.41	0.0578
500	13	500	64.8	565	54	7	3.43	3.43	10.3	30.9	1,887.9	153.80	0.0578
560	7	560	38.7	599	45	7	3.98	2.65	7.96	31.8	1,848.2	133.74	0.0516
560	13	560	70.9	631	54	19	3.63	2.18	10.9	32.7	2,103.4	172.59	0.0516
630	7	630	43.6	674	45	7	4.22	2.81	8.44	33.8	2,079.2	150.45	0.0459
630	13	630	79.8	710	54	19	3.85	2.31	11.6	34.7	2,366.3	191.77	0.0459
710	7	710	49.1	759	45	7	4.48	2.99	8.96	35.9	2,343.2	169.56	0.0407
710	13	710	89.9	800	54	19	4.09	2.45	12.3	36.8	2,666.8	216.12	0.0407
800	4	800	34.6	835	72	7	3.76	2.51	7.52	37.6	2,480.2	167.41	0.0361
800	8	800	66.7	867	84	7	3.48	3.48	10.4	38.3	2,732.7	205.33	0.0362
800	13	800	101	901	54	19	4.34	2.61	13.0	39.1	3,004.9	243.52	0.0362
900	4	900	38.9	939	72	7	3.99	2.66	7.98	39.9	2,790.2	188.33	0.0321
900	8	900	75.0	975	84	7	3.69	3.69	11.1	40.6	3,074.2	226.50	0.0322
1,000	4	1,000	43.2	1,043	72	7	4.21	2.80	8.41	42.1	3,100.3	209.26	0.0289
1,120	4	1,120	47.3	1,167	72	19	4.45	1.78	8.90	44.5	3,464.9	234.53	0.0258
1,120	8	1,120	91.2	1,211	84	19	4.12	2.47	12.4	45.3	3,811.5	283.17	0.0258
1,250	8	1,250	102	1,352	84	19	4.35	2.61	13.1	47.9	4,253.9	316.04	0.0232
1,250	4	1,250	52.8	1,303	72	19	4.70	1.88	9.40	47.0	3,867.1	261.75	0.0231

AACSR/EST Aluminum-alloy Conductors, Extra-high Strength Steel Reinforced



Application

This standard covers aluminum-alloy(aluminum-magnesium-silicon type) stranded conductors extra high strength steel with class 1 zinc-coating reinforced which could withstand extra high tensile load to be used mainly for overhead transmission lines, overhead distribution lines.

Construction

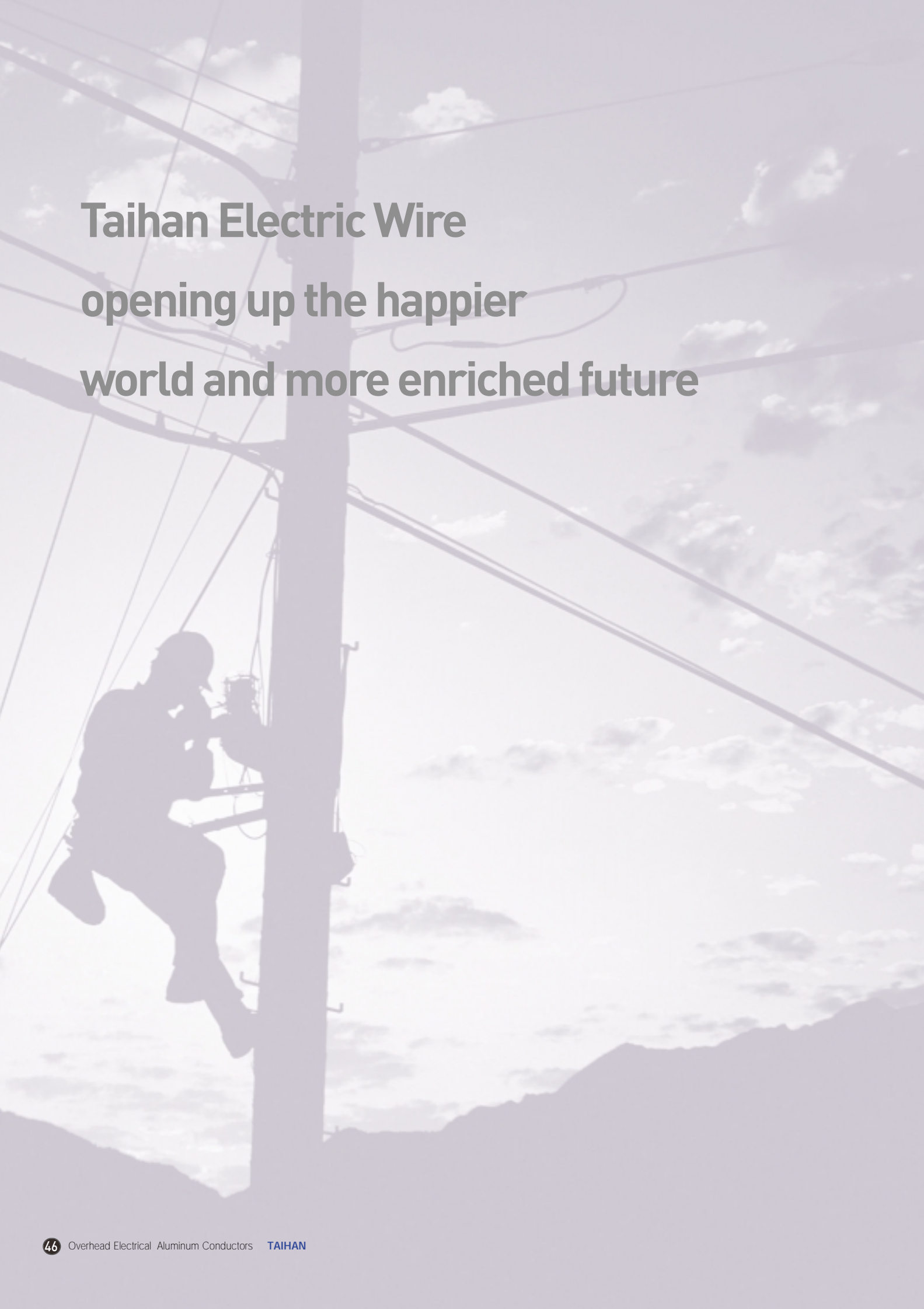
The center wire or wires are of extra-high strength galvanized steel and the outer layer or layers of aluminum-alloy.

Standards

Conforms to IEC 1089-91

(Table 59)

Code Number (No.)	Steel Ratio (%)	Areas (mm ²)			No. of Wires (No.)		Wire Dia. (mm)		Diameter (mm)		Linear Mass (kg/km)	Rated Strength (kN)	D.C. Resistance (Ω/km)
		Al	St	Total	Al	St	Al	St	Core	Conductor			
16	17	18.6	3.10	21.7	6	1	1.99	1.99	1.99	5.96	75.1	10.53	1.7934
25	17	29.0	4.84	33.9	6	1	2.48	2.48	2.48	7.45	117.3	16.27	1.1478
40	17	46.5	7.75	54.2	6	1	3.14	3.14	3.14	9.42	187.7	25.79	0.7174
63	17	73.2	12.2	85.4	6	1	3.94	3.94	3.94	11.8	295.6	39.41	0.4555
100	6	116	6.46	123	18	1	2.87	2.87	2.87	14.3	369.9	46.86	0.2880
125	6	145	8.07	153	18	1	3.21	3.21	3.21	16.0	462.3	58.34	0.2304
125	16	145	23.7	169	26	7	2.67	2.07	6.22	16.9	585.4	81.50	0.2310
160	6	186	10.3	196	18	1	3.63	3.63	3.63	18.1	591.8	72.40	0.1800
160	16	186	30.3	216	26	7	3.02	2.35	7.04	19.1	749.4	103.11	0.1805
200	6	232	12.9	245	18	1	4.05	4.05	4.05	20.3	739.8	90.50	0.1440
200	16	232	37.8	270	26	7	3.37	2.62	7.87	21.4	936.7	128.89	0.1444
250	10	290	28.5	319	22	7	4.10	2.28	6.83	23.2	1,023.2	131.72	0.1154
250	16	290	47.3	338	26	7	3.77	2.93	8.80	23.9	1,170.9	158.21	0.1155
315	7	366	25.3	391	45	7	3.22	2.15	6.44	25.7	1,207.9	155.64	0.0917
315	16	366	59.6	426	26	7	4.23	3.29	9.88	26.8	1,475.3	197.55	0.0917
400	7	465	32.1	497	45	7	3.63	2.42	7.25	29.0	1,533.9	191.71	0.0722
400	13	465	60.2	525	54	7	3.31	3.31	9.93	29.8	1,754.9	234.19	0.0723
450	7	523	36.1	559	45	7	3.85	2.56	7.69	30.8	1,725.6	215.67	0.0642
450	13	523	67.8	591	54	7	3.51	3.51	10.5	31.6	1,974.2	255.52	0.0643
500	7	581	40.2	621	45	7	4.05	2.70	8.11	32.4	1,917.3	239.63	0.0578
500	13	581	75.3	656	54	7	3.70	3.70	11.1	33.3	2,193.6	283.91	0.0578
560	7	651	45.0	696	45	7	4.29	2.86	8.58	34.3	2,147.4	268.39	0.0516
560	13	651	82.4	733	54	19	3.92	2.35	11.8	35.3	2,444.0	321.17	0.0516
630	4	732	31.6	764	72	7	3.60	2.40	7.20	36.0	2,269.4	275.18	0.0459
630	13	732	92.7	825	54	19	4.15	2.49	12.5	37.4	2,749.5	361.32	0.0459
710	4	825	35.6	861	72	7	3.82	2.55	7.64	38.2	2,557.6	310.12	0.0407
710	13	825	104	929	54	19	4.41	2.65	13.2	39.7	3,098.6	407.20	0.0407
800	4	930	40.2	970	72	7	4.05	2.70	8.11	40.5	2,881.8	349.43	0.0361
800	8	930	77.5	1,007	84	7	3.75	3.75	11.3	41.3	3,175.1	396.60	0.0362
900	4	1,046	45.2	1,091	72	7	4.30	2.87	8.60	43.0	3,242.0	393.11	0.0321
900	8	1,046	87.1	1,133	84	7	3.98	3.98	11.9	43.8	3,572.0	446.17	0.0322
1,000	8	1,162	94.6	1,257	84	19	4.20	2.52	12.6	46.2	3,954.1	499.40	0.0289
1,120	8	1,301	106	1,407	84	19	4.44	2.66	13.3	48.9	4,428.6	559.33	0.0258



Taihan Electric Wire
opening up the happier
world and more enriched future



OVERHEAD ELECTRICAL

ALUMINUM CONDUCTORS

British Standards

BS

Australian Standards

AS

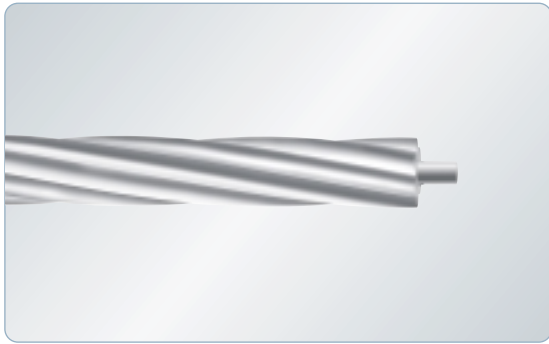
Canadian Standards Association

CSA

Deutsches Normen

DIN

AAC Stranded All-aluminum Conductors



Application

This standard covers all-aluminum stranded conductors to be used mainly for overhead distribution wire, overhead feeders and buses.

Construction

All-aluminum stranded conductors

Standards

Conforms to BS 215 : part 1/1970

(Table 60)

Code Word	Nominal Aluminum Area (mm ²)	Equivalent Area (HDCC) (mm ²)	Stranding & Wire Dia. (mm)	Approx. Overall Dia. (mm)	Total Area (mm ²)	Weight (kg/km)	Nominal Breaking Load (kgf)	Max. D.C. Resistance (kΩ•km, 20 °C)	Rating (amps)	
									Temperate	Tropical
Midge	22	14.2	7/2.06	6.18	23.33	64	408	1.227	114	72
Aphis	-	16.1	3/3.35	7.2	26.4	73	419	1.081	139	87
Gnat	-	16.1	7/2.21	6.6	26.8	73	468	1.068	124	78
Weevil	-	19.4	3/3.66	7.9	31.6	86	496	0.9082	147	95
Mosquito	-	22.6	7/2.59	7.8	37.0	101	617	0.7731	144	93
Ladybird	-	25.8	7/2.79	8.4	42.8	117	701	0.6694	159	101
Ant	50	32.3	7/3.10	9.3	52.83	145	846	0.5419	181	112
Fly	60	38.7	7/3.40	10.2	63.55	174	1,010	0.4505	199	124
Bluebottle	-	45.2	7/3.66	11.0	73.7	202	1,158	0.3884	219	132
Earwig	-	48.4	7/3.78	11.4	78.5	215	1,218	0.3645	227	136
Grasshopper	-	51.6	7/3.91	11.7	84.1	230	1,303	0.3405	238	141
Clegg	-	58.1	7/4.17	12.5	95.6	262	1,482	0.2994	256	150
Wasp	100	64.5	7/4.39	13.17	106.0	290	1,632	0.2702	271	158
Beetle	-	64.5	19/2.67	13.4	106.6	293	1,776	0.2699	274	172
Bee	-	80.6	7/4.90	14.7	132.0	361	2,083	0.2169	308	175
Cricket	-	96.8	7/5.36	16.1	157.9	432	2,432	0.1814	342	189
Hornet	150	96.8	19/3.25	16.25	157.6	434	2,519	0.1825	346	190
Caterpillar	-	113.0	19/3.53	17.7	186.0	512	2,920	0.1547	380	204
Chafer	200	129.0	19/3.78	18.9	213.2	587	3,304	0.1349	414	215
Spider	-	145.0	19/3.99	20.0	236.9	652	3,672	0.1214	439	224
Cockroach	250	161.0	19/4.22	21.1	265.7	731	4,120	0.10830	470	232
Butterfly	300	194.0	19/4.65	23.25	322.7	888	4,966	0.08916	528	247
Moth	-	226.0	19/5.00	25.0	373.2	1,027	5,748	0.07709	572	256
Drone	-	226.0	37/3.58	25.1	373.3	1,029	5,858	0.07723	572	257
Locust	-	258.0	19/5.36	26.8	428.5	1,179	6,601	0.06714	626	263
Centipede	400	258.0	37/3.78	26.46	415.2	1,145	6,434	0.06844	619	262
Maybug	-	290.0	37/4.09	28.6	486.9	1,342	7,547	0.05921	676	268
Scorpion	-	323.0	37/4.27	29.9	529.5	1,460	8,156	0.05445	710	269
Cicada	-	387.0	37/4.65	32.6	628.6	1,733	9,682	0.04587	784	266
Tarantula	-	484.0	37/5.23	36.6	794.8	2,191	12,247	0.03628	899	241

No. of Wires in Conductor	Stranding Constants		Practical(final) Modulus of Elasticity (hbar)	Coefficient of Linear (Expansion/°C)
	Mass	Electrical Resistance		
7	7.091	0.1447	5,900	23.0 × 10 ⁻⁶
19	19.34	0.05357	5,600	23.0 × 10 ⁻⁶
37	37.74	0.02757	5,600	23.0 × 10 ⁻⁶

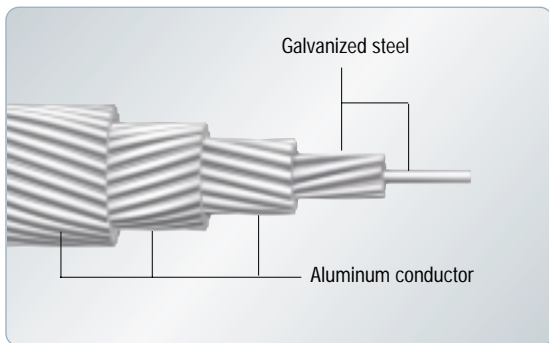
Note : These values are given for information only. 1 hbar=10MN/m²=10N/mm²

Aluminum Wires Used in the Construction of Standard Aluminum Stranded Conductors

1	2	3	4	5
Standard Dia. (mm)	Cross Sectional Area of Standard Dia. Wire (mm ²)	Mass (kg/km)	Standard Resistance (Ω/km, 20 °C)	Min. Breaking Load for Standard Dia. Wire (N)
2.06	3.333	9.009	8.480	600
3.10	7.548	20.40	3.745	1,250
3.25	8.296	22.42	3.407	1,370
3.40	9.079	24.54	3.113	1,490
3.78	11.22	30.33	2.519	1,800
4.22	13.99	37.81	2.021	2,240
4.39	15.14	40.91	1.867	2,410
4.65	16.98	45.90	1.664	2,700

Note : The values given in columns 2 to 5 are given for information only.

ACSR Aluminum Conductors, Steel Reinforced



Application

This standard covers aluminum stranded conductors steel reinforced which could withstand high tensile load to be used mainly for overhead transmission lines, overhead distribution lines.

Construction

The center wire or wires are of steel and the outer layer or layers of aluminum.

Standards

Conforms to BS 215 : part 2/1970

(Table 61)

Code Word	Nominal Al Area (mm ²)	Equiv. Area (HDCC) (mm ²)	Stranding and Wire Dia. (mm)		Overall Dia. (mm)	Area (mm ²)			Weight (kg/km)			Nominal Breaking Load		Max. D.C. Resistance (Ω/km, 20°C)	Rating (amps)	
			Al	St		Al	St	Total	Al	St	Total	N	kgf		Temperate	Tropical
			Mole	-		6.5	6/1.50	1/1.50	4.50	10.62	1.77	12.39	29		14	43
Squirrel	-	12.9	6/2.11	1/2.11	6.33	20.94	3.49	24.43	58	27	85	7,900	806	1.370	109	69
Gopher	25	16.1	6/2.36	1/2.36	7.08	26.24	4.37	30.62	72	34	106	9,610	980	1.093	126	77
Weasel	30	19.4	6/2.59	1/2.59	7.77	31.61	5.27	36.88	87	41	128	11,450	1,168	0.9077	134	84
Fox	-	22.6	6/2.79	1/2.79	8.37	36.66	6.11	42.77	101	48	149	13,200	1,346	0.7827	147	93
Ferret	40	25.8	6/3.00	1/3.00	9.00	42.41	7.07	49.48	117	55	172	15,200	1,550	0.6766	161	98
Rabbit	50	32.3	6/3.35	1/3.35	10.05	52.88	8.81	61.70	145	69	214	18,350	1,871	0.5426	185	112
Mink	-	38.7	6/3.66	1/3.66	10.98	63.18	10.53	73.71	173	82	255	21,800	2,223	0.4541	174	103
Skunk	-	38.7	12/2.59	7/2.59	12.95	63.48	37.03	100.50	175	290	465	53,100	5,415	0.4565	246	139
Beavor	-	45.2	6/3.99	1/3.99	11.97	74.82	12.47	87.29	205	97	302	25,700	2,621	0.3834	193	110
Horse	70	45.2	12/2.79	7/2.79	13.95	73.37	42.80	116.20	203	335	538	61,200	6,241	0.3936	268	148
Raccoon	-	48.4	6/4.10	1/4.10	12.30	79.20	13.20	92.40	217	103	320	27,200	2,774	0.3623	231	131
Otter	-	51.6	6/4.22	1/4.22	12.66	83.88	13.98	97.86	230	109	339	28,700	2,927	0.3421	240	137
Cat	-	58.1	6/4.50	1/4.50	13.50	95.40	15.90	111.30	262	124	386	32,700	3,335	0.3008	248	145
Hare	-	64.5	6/4.72	1/4.72	14.16	105.0	17.50	122.50	288	137	425	36,000	3,671	0.2733	273	151
Dog	100	64.5	6/4.72	7/1.57	14.15	105.0	13.50	118.5	288	106	394	32,700	3,335	0.2733	278	153
Hyena	-	64.5	7/4.39	7/1.93	14.57	105.8	20.44	126.2	290	160	450	40,900	4,171	0.2712	287	155
Leopard	-	80.7	6/5.28	7/1.75	15.81	131.3	18.80	148.1	360	132	492	40,700	4,150	0.2185	316	167
Coyote	-	80.7	26/2.54	7/1.91	15.89	132.1	20.09	152.2	365	157	522	46,400	4,732	0.2187	311	164
Cougar	-	80.7	18/3.05	1/3.05	15.25	130.3	7.24	137.5	362	267	419	29,800	3,039	0.2210	314	168
Tiger	-	80.7	30/2.36	7/2.36	16.52	131.1	30.59	161.7	362	240	602	58,000	5,914	0.2204	323	164
Wolf	150	96.8	30/2.59	7/2.59	18.13	158.0	36.88	194.9	437	280	726	69,200	7,056	0.1828	355	162
Dingo	150	97.9	18/3.35	1/3.35	16.75	158.7	8.80	167.5	437	69	506	35,700	3,640	0.1815	349	179
Lynx	175	113.0	30/2.79	7/2.79	19.53	183.4	42.77	226.2	507	335	842	79,800	8,137	0.1576	386	178
Caracal	175	113.7	18/3.61	1/3.61	18.05	184.3	10.24	194.5	507	81	588	41,000	4,181	0.1563	383	205
Jaguar	200	130	18/3.86	1/3.86	19.30	210.6	11.69	222.3	580	91	671	46,550	4,747	0.13670	415	197
Panther	200	129	30/3.00	7/3.00	21.00	212.0	49.49	261.5	586	388	974	92,250	9,407	0.1363	421	191
Lion	-	145	30/3.18	7/3.18	22.26	238.5	55.65	294.2	659	436	1,095	100,600	10,258	0.1212	448	195
Bear	250	161	30/3.35	7/3.35	23.45	264.0	61.60	325.6	730	483	1,213	111,100	11,329	0.1095	481	198
Batang	-	194	18/4.78	7/1.68	24.16	323.0	15.52	338.52	888	121	1,009	70,900	7,240	0.0894	510	165
Goat	300	194	30/3.71	7/3.71	25.97	324.3	75.67	400.0	896	593	1,489	135,700	13,838	0.08910	542	200
Sheep	-	226	30/3.99	7/3.99	27.93	374.1	87.29	461.4	1,034	684	1,718	155,900	15,897	0.07724	592	197
Antelope	-	226	54/2.97	7/2.97	26.73	373.1	48.37	421.5	1,032	379	1,411	118,200	12,053	0.07747	588	208
Bison	-	226	54/3.00	7/3.00	27.00	381.8	49.49	431.3	1,056	388	1,444	120,900	12,328	0.07571	595	208
Deer	-	258	30/4.27	7/4.27	29.89	429.3	100.20	529.5	1,186	785	1,971	178,500	18,202	0.06731	639	186
Zebra	400	258	54/3.18	7/3.18	28.62	428.9	55.59	484.5	1,186	435	1,621	131,900	13,450	0.06740	635	202
Elk	-	290	30/4.50	7/4.50	31.50	477.0	111.30	588.3	1,318	872	2,190	198,200	20,211	0.06058	679	165
Camel	-	290	54/3.35	7/3.35	30.15	475.2	61.60	536.8	1,314	483	1,797	145,700	14,857	0.06083	677	192
Moose	-	323	54/3.53	7/3.53	31.77	528.7	68.53	597.2	1,462	537	1,999	161,100	16,428	0.05468	763	176

ACSR Aluminum Conductors, Steel Reinforced

No. of Wires in Conductor (No.)		Stranding Constants			Practical (final) Modulus of Elasticity (hbar)	Coefficient of Linear Expansion/ °C)
		Mass		Electrical Resistance		
Al	St	Al	St			
6	1	6.091	1.000	0.1692	7,900	19.1×10^{-6}
6	7	6.091	7.032	0.1692	7,500	19.8×10^{-6}
12	7	12.26	7.032	0.08514	10,500	15.3×10^{-6}
18	1	18.34	1.000	0.05660	6,600	21.2×10^{-6}
30	7	30.67	7.032	0.03408	8,000	17.8×10^{-6}
54	7	55.23	7.032	0.01894	6,900	19.3×10^{-6}

Notes : These values are given for information purpose only.
1 hbar = 10 MN/m² = 10 N/mm²

Aluminum Wires Used in the Construction of Standard Aluminum Conductors, Steel-reinforced

1	2	3	4	5
Standard Dia. (mm)	Cross Sectional Area of Standard Dia. Wire (mm ²)	Mass (kg/km)	Standard Resistance (Ω /km, 20 °C)	Min. Breaking Load for Standard Dia. Wire (N)
2.36	4.374	11.82	6.461	770
2.59	5.269	14.24	5.365	906
2.79	6.114	16.53	4.623	1,030
3.00	7.069	19.11	3.999	1,190
3.18	7.942	21.47	3.559	1,310
3.35	8.814	23.82	3.207	1,450
3.61	10.24	27.67	2.761	1,660
3.86	11.40	31.63	2.415	1,870
4.72	17.50	47.30	1.615	2,780

Note : The values in column 2 to 5 are given for information only.
BS 4565. "Galvanized steel wire for aluminum conductors, steel-reinforced."

Steel Wires Used in the Construction of Standard Aluminum Conductors, Steel-reinforced

1	2	3	4
Standard Dia. (mm)	Cross Sectional Area of Standard Dia. Wire (mm ²)	Mass (kg/km)	Min. Load at 1% Elongation for Standard Dia. Wire (N)
1.57	1.936	15.10	2,280
2.36	4.374	34.12	4,990
2.59	5.269	41.09	6,010
2.79	6.414	47.69	6,570
3.00	7.069	55.13	8,060
3.18	7.942	61.95	8,740
3.35	8.814	68.75	9,700
3.61	10.24	79.84	11,260
3.86	11.70	91.28	12,870

Note : The values in column 2 to 4 are given for information only.

AAC Stranded All-aluminum Conductors



Application

This standard covers stranded hard-drawn circular aluminum conductors to be used mainly for overhead distribution wires, overhead feeder.

Construction

Stranded hard-drawn aluminum conductors

Standards

Conforms to AS 1531/1991

(Table 62)

Code Word	1	2	3	4	5	6	7
	Stranding & Wire Dia. (mm)	Approx Overall Dia. (mm)	Sectional Area (mm ²)	Calculated Equivalent Al Area (mm ²)	Approx. Mass (kg/km)	Min. Calculated Breaking Load (kN)	Calculated D.C. Resistance (Ω /km, 20 °C)
Leo	7/2.50	7.50	34.36	33.9	94.3	5.71	0.833
Leonids	7/2.75	8.25	41.58	41.1	113	6.72	0.689
Libra	7/3.00	9.00	49.48	48.9	135	7.98	0.579
Mars	7/3.75	11.3	77.28	76.3	211	11.8	0.370
Mercury	7/4.50	13.5	111.3	110	304	16.9	0.258
Moon	7/4.75	14.3	124.0	122	339	18.9	0.232
Neptune	19/3.25	16.3	157.6	154	433	24.7	0.183
Orion	19/3.50	17.5	182.8	180	503	28.7	0.157
Pluto	19/3.75	18.8	209.8	206	576	31.9	0.137
Saturn	37/3.00	21.0	261.6	256	721	42.2	0.110
Sirius	37/3.25	22.8	307.0	301	845	48.2	0.094
Taurus	19/4.75	23.8	336.7	331	924	51.3	0.0857
Triton	37/3.75	26.3	408.5	400	1,120	62.2	0.0706
Uranus	61/3.25	29.3	506.1	495	1,400	75.2	0.0572
Ursula	61/3.50	31.5	586.9	574	1,620	87.3	0.0493
Venus	61/3.75	33.8	673.4	659	1,860	97.2	0.0493

Notes : 1. The sectional area is the sum of the cross sectional areas of the relevant individual wires.
2. For the basis of calculation of columns 4, 5, 6 and 7, see (AS 1531) Appendix A.

ACSR/GZ Aluminum Conductors, Galvanized Steel Reinforced (AS 3607/1989)

(Table 63)

Code Word	1	2	3	4	5	6	7	8
	Stranding and Wire Dia. (mm)		Approx. Overall Dia. (mm)	Sectional Area (mm ²)	Calculated Equiv. Al Area (mm ²)	Approx. Mass (kg/km)	Min. Calculated Breaking Load (kN)	Calculated D.C. Resistance (Ω /km, 20 °C)
	Al	Galvanized St						
Almond	6/2.50	1/2.50	7.50	34.36	29.0	119	10.5	0.975
Apricot	6/2.75	1/2.75	8.3	41.58	35.1	144	12.6	0.805
Apple	6/3.00	1/3.00	9.00	49.48	41.8	171	14.9	0.677
Banana	6/3.75	1/3.75	11.3	77.31	65.2	268	22.7	0.433
Cherry	6/4.75	7/1.60	14.3	120.4	105	402	33.4	0.271
Grape	30/2.50	7/2.50	17.5	181.6	144	677	63.5	0.196
Lemon	30/3.00	7/3.00	21.0	261.5	207	973	90.4	0.136
Lychee	30/3.25	7/3.25	22.8	306.9	243	1,140	105	0.116
Lime	30/3.50	7/3.50	24.5	356.0	282	1,320	122	0.100
Mango	54/3.00	7/3.00	27.0	431.2	373	1,440	119	0.0758
Orange	54/3.25	7/3.25	29.3	506.0	438	1,690	137	0.0646
Olive	54/3.50	7/3.50	31.5	586.9	508	1,960	159	0.0557
Paw Paw	54/3.75	19/2.25	33.8	672.0	583	2,240	178	0.0485

Standard High Strength Conductors

Quince	3/1.75	4/1.75	5.3	16.84	8.74	95	12.7	3.25
Raisin	3/2.50	4/2.50	7.50	34.36	17.8	195	24.4	1.59
Sultana	4/3.00	3/3.00	9.00	49.48	31.5	243	28.3	0.897
Walnut	4/3.75	3/3.75	11.3	77.31	49.2	380	43.9	0.573

Notes : 1. The sectional area is the sum of the cross sectional areas of the relevant individual wires.
2. For the basis of calculation of columns 5, 6, 7 and 8, see (AS 3607) Appendix A.

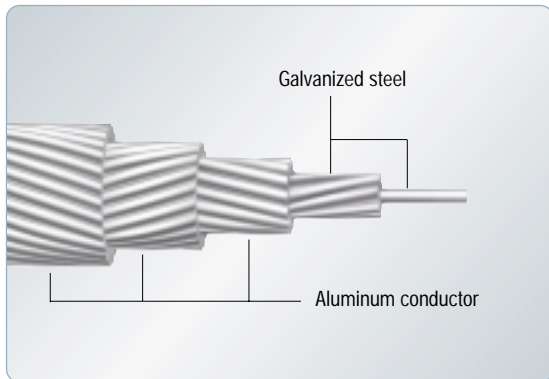
ACSR/AZ Aluminum Conductors, Aluminized Steel Reinforced (AS 3607/1989)

(Table 64)

Code Word	1	2	3	4	5	6	7	8
	Stranding and Wire Dia. (mm)		Approx. Overall Dia. (mm)	Sectional Area (mm ²)	Calculated Equiv. Al Area (mm ²)	Approx. Mass (kg/km)	Min. Calculated Breaking Load (kN)	Calculated D.C. Resistance (Ω /km, 20 °C)
	Al	Galvanized St						
Barley	6/2.50	1/2.50	7.50	34.36	29.0	118	10.2	0.975
Bean	6/3.00	1/3.00	9.00	49.48	41.8	170	14.5	0.677
Cabbage	6/3.75	1/3.75	11.3	77.31	65.2	265	21.4	0.433
Carrot	6/4.75	7/1.60	14.3	120.4	105	399	32.0	0.271

Notes : 1. The sectional area is the sum of the cross sectional areas of the relevant individual wires.
2. For the basis of calculation of columns 5, 6, 7 and 8, see (AS 3607) Appendix A.

ACSR Aluminum Conductors, Steel Reinforced



Application

This standard covers aluminum stranded conductors steel reinforced which could withstand high tensile load to be used mainly for overhead transmission lines, overhead distribution lines.

Construction

The center wire or wires are of galvanized steel and the outer layer or layers of aluminum.

Standards

Conforms to CSA C49.1

(Table 65)

Code Word	* Conductor Type	Nominal Area				Stranding No. and Nominal Dia. of Wires (in)				Nominal Dia. (in)		Rated Tensile Strength (pound)	D.C. Resistance ($\Omega/1000ft, 20^\circ C$)	Nominal Weight (pound/1000ft)		
		Al		St	Complete Conductor	Al		St		St Core	Complete Conductor			Al	St	Total
		AWG or CMILS	sq in			No.	Dia.	No.	Dia.							
			sq in	sq in	sq in											
Wren	17	8	0.0130	0.0022	0.0152	6	0.0525	1	0.0525	0.0525	0.158	745	1.0452	15.4	7.3	22.7
Turkey	17	6	0.0206	0.0034	0.0240	6	0.0661	1	0.0661	0.0661	0.198	1,170	0.6577	24.5	11.6	36.1
Swan	17	4	0.0328	0.0055	0.0383	6	0.0834	1	0.0834	0.0834	0.250	1,830	0.4134	39.0	18.4	57.4
Sparrow	17	2	0.0521	0.0087	0.0608	6	0.1052	1	0.1052	0.1052	0.316	2,790	0.2601	62.0	29.3	91.3
Robin	17	1	0.0657	0.0110	0.0767	6	0.1181	1	0.1181	0.1181	0.354	3,480	0.2062	78.1	37.0	115.1
Raven	17	1/0	0.0829	0.0138	0.0967	6	0.1327	1	0.1327	0.1327	0.398	4,290	0.1634	98.6	46.6	145.2
Quail	17	3/0	0.1045	0.0174	0.1219	6	0.1489	1	0.1489	0.1489	0.447	5,350	0.1297	124.3	58.8	183.1
Pigeon	17	3/0	0.1318	0.0220	0.1538	6	0.1672	1	0.1672	0.1672	0.502	6,570	0.1028	156.7	74.1	230.8
Penguin	17	4/0	0.1662	0.0277	0.1939	6	0.1878	1	0.1878	0.1878	0.563	8,420	0.0816	197.6	93.4	291.0
Owl	13	266,800	0.2095	0.0272	0.2367	6	0.2109	7	0.0703	0.2109	0.633	9,540	0.0647	249	92	341
Waxwing	6	266,800	0.2095	0.0115	0.2210	18	0.1217	1	0.1217	0.1217	0.609	7,100	0.0649	250	39	289
Partridge	16	266,800	0.2095	0.0341	0.2436	26	0.1013	7	0.0788	0.2364	0.642	11,300	0.0651	251	116	367
Phoebe	6	300,000	0.2356	0.0131	0.2487	18	0.1291	1	0.1291	0.1291	0.646	7,980	0.0577	281	44	325
Ostrich	16	300,000	0.2356	0.0383	0.2739	26	0.1074	7	0.0835	0.2505	0.680	12,600	0.0579	282	130	412
Piper	23	300,000	0.2356	0.0550	0.2906	30	0.1000	7	0.1000	0.3000	0.700	15,400	0.0579	282	186	468
Merlin	6	336,400	0.2642	0.0147	0.2789	18	0.1367	1	0.1367	0.1367	0.684	8,950	0.0515	315	50	365
Linnet	16	336,400	0.2642	0.0431	0.3073	26	0.1137	7	0.0884	0.2652	0.720	14,000	0.0516	316	146	462
Oriole	23	336,400	0.2642	0.0617	0.3259	30	0.1059	7	0.1059	0.3177	0.741	17,000	0.0517	316	209	525
Chickadee	6	397,500	0.3122	0.0173	0.3295	18	0.1486	1	0.1486	0.1486	0.743	10,400	0.0436	373	58	431
Ibis	16	397,500	0.3122	0.0508	0.3630	26	0.1236	7	0.0961	0.2883	0.783	16,200	0.0437	373	172	545
Lark	23	397,500	0.3122	0.0728	0.3850	30	0.1151	7	0.1151	0.3453	0.806	20,000	0.0437	374	247	621
Pelican	6	477,000	0.3746	0.0208	0.3954	18	0.1628	1	0.1628	0.1628	0.814	12,300	0.0363	447	70	517
Toucan	10	477,000	0.3746	0.0368	0.4114	22	0.1472	7	0.0818	0.2454	0.834	15,400	0.0364	448	125	573
Hawk	16	477,000	0.3746	0.0611	0.4357	26	0.1354	7	0.1053	0.3159	0.858	19,400	0.0364	448	207	655
Hen	23	477,000	0.3746	0.0874	0.4620	30	0.1261	7	0.1261	0.3783	0.883	23,400	0.0364	448	296	744
Heron	23	500,000	0.3927	0.0916	0.4843	30	0.1291	7	0.1291	0.3873	0.904	24,500	0.0348	470	310	780
Sapsucker	10	556,500	0.4371	0.0429	0.4800	22	0.1590	7	0.0883	0.2649	0.901	17,800	0.0312	522	145	667
Dove	16	556,500	0.4371	0.0712	0.5083	26	0.1463	7	0.1138	0.3414	0.927	22,500	0.0312	523	241	764
Eagle	23	556,500	0.4371	0.1020	0.5391	30	0.1362	7	0.1362	0.4086	0.953	27,200	0.0312	523	345	868
-	10	605,000	0.4752	0.0466	0.5218	22	0.1658	7	0.0921	0.2763	0.940	19,100	0.0287	568	158	726
Duck	13	605,000	0.4752	0.0617	0.5369	54	0.1058	7	0.1058	0.3174	0.952	22,500	0.0287	569	209	778
Goldfinch	10	636,000	0.4995	0.0490	0.5485	22	0.1700	7	0.0944	0.2832	0.963	20,100	0.0273	597	166	763
Grosbeak	16	636,000	0.4995	0.0813	0.5808	26	0.1564	7	0.1216	0.3648	0.990	25,000	0.0273	597	275	872
Egret	23	636,000	0.4995	0.1140	0.6133	30	0.1456	19	0.0874	0.4370	1.019	31,600	0.0273	598	387	985

* Conductor type means the ratio of steel to aluminum areas in percent.

ACSR Aluminum Conductors, Steel Reinforced

(Table 65)

Code Word	* Conductor Type	Nominal Area				Stranding No. and Nominal Dia. of Wires (in)				Nominal Dia. (in)		Rated Tensile Strength (pound)	D.C. Resistance (Ω /1000ft, 20 °C)	Nominal Weight (pound/1000ft)		
		Al		St sq in	Complete Conductor sq in	Al		St		St Core	Complete Conductor			Al	St	Total
		AWG or CMILS	sq in			No.	Dia.	No.	Dia.							
Goose	13	636,000	0.4995	0.0647	0.5642	54	0.1085	7	0.1085	0.3255	0.977	23,700	0.0273	599	219	818
Gull	5	666,600	0.5235	0.0269	0.5504	42	0.1260	7	0.0700	0.2100	0.966	17,700	0.0261	627	91	718
-	13	666,600	0.5235	0.0679	0.5914	54	0.1111	7	0.1111	0.3333	1.000	24,500	0.0261	627	230	857
Starling	16	715,500	0.5620	0.0915	0.6535	26	0.1659	7	0.1290	0.3870	1.051	28,100	0.0243	672	310	982
Redwing	23	715,500	0.5620	0.1280	0.6900	30	0.1544	19	0.0926	0.4630	1.081	34,600	0.0243	673	434	1,107
-	13	715,500	0.5620	0.0289	0.5909	42	0.1305	7	0.0725	0.2175	1.001	19,000	0.0243	673	98	771
Crow	13	715,500	0.5620	0.0728	0.6348	42	0.1151	7	0.1151	0.3453	1.036	26,300	0.0243	673	247	920
Drake	16	795,000	0.6244	0.1017	0.7261	26	0.1749	7	0.1360	0.4080	1.108	31,300	0.0218	747	344	1,091
Mallard	23	795,000	0.6244	0.1424	0.7668	30	0.1628	19	0.0977	0.4885	1.140	38,500	0.0219	747	484	1,231
Macaw	5	795,000	0.6244	0.0321	0.6565	42	0.1376	7	0.0764	0.2292	1.055	21,100	0.0219	747	109	856
Condor	13	795,000	0.6244	0.0809	0.7053	54	0.1213	7	0.1213	0.3639	1.092	28,500	0.0219	748	274	1,022
-	5	874,500	0.6868	0.0354	0.7222	42	0.1443	7	0.0802	0.2406	1.106	22,800	0.0199	822	120	942
Crane	13	874,500	0.6868	0.0891	0.7759	54	0.1273	7	0.1273	0.3819	1.146	31,400	0.0199	823	302	1,125
-	5	900,000	0.7069	0.0363	0.7432	42	0.1464	7	0.0813	0.2439	1.122	23,500	0.0193	846	123	969
Canary	13	900,000	0.7069	0.0916	0.7985	54	0.1291	7	0.1291	0.3873	1.162	32,300	0.0193	847	310	1,157
Phoenix	5	954,000	0.7493	0.0385	0.7878	42	0.1507	7	0.0837	0.2511	1.155	24,500	0.0182	897	130	1,027
Cardinal	13	954,000	0.7493	0.0971	0.8464	54	0.1329	7	0.1329	0.3987	1.196	34,300	0.0182	898	329	1,227
Snowbird	5	1,033,500	0.8117	0.0418	0.8535	42	0.1569	7	0.0872	0.2616	1.203	26,600	0.0168	972	141	1,113
Curlew	13	1,033,500	0.8117	0.1052	0.9169	54	0.1383	7	0.1383	0.4149	1.245	37,100	0.0168	973	356	1,328
Beaumont	5	1,113,000	0.8741	0.0449	0.9190	42	0.1628	7	0.0904	0.2712	1.248	28,400	0.0156	1,046	152	1,198
Finch	13	1,113,000	0.8741	0.1109	0.9850	54	0.1436	19	0.0862	0.4310	1.293	40,300	0.0156	1,048	376	1,424
-	5	1,192,500	0.9366	0.0482	0.9484	42	0.1685	7	0.0936	0.2808	1.292	30,400	0.0146	1,121	163	1,284
Grackle	13	1,192,500	0.9366	0.1187	1.0553	54	0.1486	19	0.0892	0.4460	1.338	43,100	0.0146	1,122	403	1,525
Scissortail	5	1,272,000	0.9990	0.0514	1.0504	42	0.1740	7	0.0967	0.2901	1.334	32,500	0.0137	1,196	174	1,370
Pheasant	13	1,272,000	0.9990	0.1266	1.1256	54	0.1535	19	0.0921	0.4605	1.382	44,900	0.0137	1,197	430	1,627
-	5	1,351,500	1.0615	0.0546	1.1161	42	0.1794	7	0.0997	0.2991	1.376	34,500	0.0129	1,271	185	1,456
Martin	13	1,351,500	1.0615	0.1344	1.1959	54	0.1582	19	0.0949	0.4745	1.424	47,600	0.0129	1,272	456	1,728
-	5	1,431,000	1.1239	0.0579	1.1818	42	0.1846	7	0.1026	0.3078	1.415	36,500	0.0121	1,345	196	1,541
Plover	13	1,431,000	1.1239	0.1424	1.2663	54	0.1628	19	0.0977	0.4885	1.465	50,500	0.0122	1,347	484	1,831
-	5	1,510,500	1.1863	0.0610	1.2473	42	0.1896	7	0.1053	0.3159	1.454	38,500	0.0115	1,420	206	1,626
Parrot	13	1,510,500	1.1863	0.1501	1.3364	54	0.1672	19	0.1003	0.5015	1.505	53,200	0.0115	1,422	511	1,933
-	9	1,590,000	1.2488	0.1102	1.3590	48	0.1820	7	0.1416	0.4248	1.517	47,600	0.0109	1,495	372	1,867
Falcon	13	1,590,000	1.2488	0.1583	1.4071	54	0.1716	19	0.1030	0.5150	1.545	56,100	0.0109	1,496	537	2,033
-	4	1,590,000	1.2488	0.0540	1.3028	72	0.1486	7	0.0991	0.2973	1.486	39,500	0.0109	1,496	183	1,679

*Conductor type means the ratio of steel to aluminum areas in percent.

Compact Aluminum Conductors Steel Reinforced (CSA C49.2)

(Table 66)

Code Word	* Conductor Type	Nominal Area				No. of Al Wires	Nominal Dia.		Rated Tensile Strength (pound)	D.C. Resistance ($\Omega/1000ft, 20^{\circ}C$)	Nominal Weight (pound/1000ft)		
		Al		St (sq in)	Complete Conductor (sq in)		(in)				Al	St	Total
		AWG or CMILS	sq in				St Wire	Conductor					
Cod	17	8	0.0130	0.0022	0.0152	6	0.0525	0.145	745	1.0452	15.4	7.3	22.7
Minnow	34	8	0.0130	0.0043	0.0173	6	0.0743	0.154	1,110	1.0452	15.4	14.6	30.0
Sardine	53	8	0.0130	0.0069	0.0199	6	0.0937	0.165	1,510	1.0452	15.4	23.3	38.7
Bass	17	6	0.0206	0.0034	0.0240	6	0.0661	0.182	1,170	0.6577	24.5	11.6	36.1
Mullet	34	6	0.0206	0.0069	0.0275	6	0.0937	0.193	1,720	0.6577	24.5	23.3	47.8
Herring	53	6	0.0206	0.0110	0.0316	6	0.1182	0.208	2,400	0.6577	24.5	37.0	61.5
Pike	17	4	0.0328	0.0055	0.0383	6	0.0834	0.229	1,830	0.4134	39.0	18.4	57.4
Pollock	34	4	0.0328	0.0110	0.0438	6	0.1182	0.243	2,710	0.4134	39.0	37.0	76.0
Flounder	53	4	0.0328	0.0174	0.0502	6	0.1490	0.264	3,690	0.4134	39.0	58.8	97.8
Carp	17	2	0.0521	0.0087	0.0608	6	0.1052	0.290	2,790	0.2601	62.0	29.3	91.3
Haddock	34	2	0.0521	0.0174	0.0695	6	0.1490	0.308	4,150	0.2601	62.0	58.8	120.8
Pickrel	53	2	0.0521	0.0277	0.0798	6	0.1878	0.331	5,790	0.2601	62.0	93.4	155.4
Shad	17	1	0.0657	0.0110	0.0767	6	0.1182	0.326	3,480	0.2062	78.1	37.0	115.1
Lamprey	34	1	0.0657	0.0220	0.0877	6	0.1672	0.346	5,190	0.2062	78.1	74.1	152.2
Sole	17	1/0	0.0829	0.0138	0.0967	6	0.1327	0.365	4,290	0.1634	98.6	46.6	145.2
Sculpin	34	1/0	0.0829	0.0277	0.1106	6	0.1878	0.388	6,510	0.1634	98.6	93.4	192.0
Hake	17	2/0	0.1045	0.0174	0.1219	6	0.1490	0.410	5,350	0.1297	124.3	58.8	183.1
Cusk	17	3/0	0.1318	0.0220	0.1538	6	0.1672	0.461	6,670	0.1028	156.7	74.1	230.8
Scup	17	4/0	0.1662	0.0277	0.1939	6	0.1878	0.517	8,420	0.0816	197.6	93.4	291.0
-	6	266,800	0.2095	0.0115	0.2210	18	0.1217	0.559	7,100	0.0647	250	39	289
-	6	336,400	0.2642	0.0147	0.2789	18	0.1367	0.628	8,950	0.0515	315	50	365

*Conductor type means the ratio of steel to aluminum areas in percent.

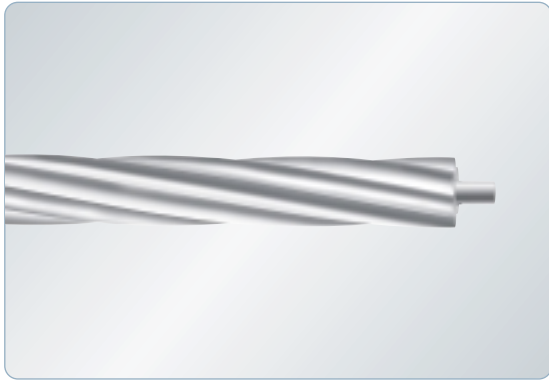
KS • JIS • KEPCO • TEC

ASTM • ANSI

IEC

BS • AS • CSA • DIN

AAC Stranded All-aluminum Conductor



Application

This standard covers stranded hard-drawn circular aluminum conductors to be used mainly for overhead distribution wire, overhead feeder.

Construction

Stranded hard-drawn aluminum conductors

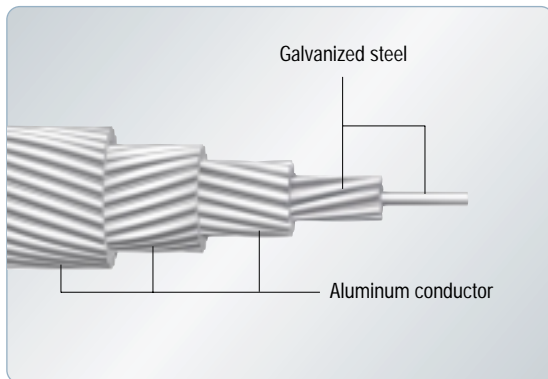
Standards

Conforms to DIN 48201

(Table 67)

Area (mm ²)		Equivalent Area (HDCC) (mm ²)	Stranding and Wires Dia. (mm)	Overall Dia. (mm)	Weight (kg/km)	Nominal Breaking Load (kp)	Max. D.C. Resistance (Ω /km, 20 °C)	Rating (amps)	
Nominal	Actual							Temperate	Tropical
16	15.89	10	7/1.7	5.1	44	290	1.8017	87	59
25	24.25	15	7/2.1	6.3	67	425	1.1806	112	74
35	34.36	21	7/2.5	7.5	94	585	0.8332	138	89
50	49.48	31	7/3.0	9.0	135	810	0.5786	172	107
50	48.36	30	19/1.8	9.0	133	860	0.5948	172	107
70	65.82	41	19/2.10	10.5	181	1,150	0.4370	206	124
95	93.27	60	19/2.50	12.5	256	1,595	0.3084	254	146
120	117.00	70	19/2.80	14.0	322	1,910	0.2459	291	160
150	147.10	90	37/2.25	15.7	408	2,570	0.1960	333	176
185	181.60	110	37/2.50	17.5	501	3,105	0.1588	379	191
240	242.5	150	61/2.25	20.2	670	4,015	0.1192	448	207
300	299.4	155	61/2.50	22.5	827	4,850	0.09651	509	217
400	400.1	245	61/2.89	26.0	1,105	6,190	0.07222	602	222
500	499.8	305	61/3.23	29.1	1,381	7,600	0.05782	689	211
625	626.2	385	91/2.96	32.8	1,733	9,690	0.04625	785	176
800	802.4	490	91/3.35	36.8	2,219	12,055	0.03611	904	52
1,000	999.7	615	91/3.74	41.1	2,766	14,845	0.02897	1,027	-

ACSR Aluminum Conductors, Steel Reinforced



Application

This standard covers aluminum stranded conductors steel reinforced which could withstand high tensile load to be used mainly for overhead transmission lines, overhead distribution lines.

Construction

The center wire or wires are of steel and the outer layer or layers of aluminum.

Standards

Conforms to DIN 48204

(Table 68)

Nominal		Area (mm ²)			Equiv. Area (HDCC) (mm ²)	Stranding and Wires Dia. (mm)		Overall Dia. (mm)	Weight (kg/km)			Nominal Breaking Load (kp)	Max. D.C. Resistance (Ω/km, 20 °C)	Rating (amps)	
Al	St	Al	St	Total		Al	St		Al	St	Total			Temperate	Tropical
16	2.5	15.3	2.6	17.9	9.6	6/1.80	1/1.80	5.4	42	20	62	595	1.8793	85	58
25	4.0	23.8	4.0	27.8	17.5	6/2.25	1/2.25	6.8	65	32	97	920	1.2028	114	74
35	6.0	34.3	5.7	40.0	21.6	6/2.70	1/2.70	8.1	94	46	140	1,265	0.8353	140	89
44	32.0	44.0	31.7	75.7	27.7	14/2.00	7/2.40	11.2	122	250	372	4,500	0.6573	170	100
50	8.0	48.3	8.0	56.3	30.4	6/3.20	1/3.20	9.6	132	64	196	1,710	0.5946	172	105
50	30	51.2	29.8	81.0	32.2	12/2.33	7/2.33	11.7	141	237	378	4,380	0.5644	187	109
70	12	69.9	11.4	81.3	44.0	26/1.85	7/1.44	11.7	193	91	284	2,680	0.4130	217	127
95	15	94.4	15.3	109.7	59.4	26/2.15	7/1.67	13.6	260	123	383	3,575	0.3058	260	145
95	55	96.5	56.3	152.8	60.8	12/3.20	7/3.20	16.0	266	446	712	7,935	0.2992	271	142
105	75	105.7	75.5	181.5	66.5	14/3.10	19/2.25	17.5	292	599	891	10,845	0.2736	289	145
120	20	121.6	19.8	141.4	76.5	26/2.44	7/1.90	15.5	336	158	494	4,565	0.2374	304	161
120	70	122.0	71.3	193.3	76.7	12/3.60	7/3.60	18.0	337	564	901	10,000	0.2364	359	154
125	30	127.9	29.8	157.7	80.4	30/2.33	7/2.33	16.1	353	238	591	5,760	0.2259	309	161
150	25	148.9	24.2	173.1	93.6	26/2.70	7/2.10	17.1	411	194	605	5,525	0.1939	341	173
170	40	171.8	40.1	211.9	108.0	30/2.70	7/2.70	18.9	475	319	794	7,675	0.1682	373	179
185	30	183.8	29.8	213.6	116	26/3.00	7/2.33	19.0	507	239	746	6,620	0.1571	386	185
210	35	209.1	34.1	243.2	132	26/3.20	7/2.49	20.3	577	273	850	7,490	0.1380	418	193
210	50	212.1	49.5	261.6	133	30/3.00	7/3.00	21.0	587	394	981	9,390	0.1363	423	190
230	30	230.9	29.8	260.7	145	24/3.50	7/2.33	21.0	638	239	877	7,310	0.1249	442	199
240	40	243.0	39.5	282.5	153	26/3.45	7/2.68	21.9	671	316	987	8,640	0.1188	457	199
265	35	263.7	34.1	297.8	166	24/3.74	7/2.49	22.4	728	274	1,002	8,305	0.1094	477	204
300	50	304.3	49.5	353.7	191	26/3.86	7/3.00	24.5	840	396	1,236	10,700	0.0949	521	205
305	40	304.6	39.5	344.1	192	54/2.68	7/2.68	24.1	843	317	1,160	9,940	0.0949	520	208
340	30	339.3	29.8	369.1	213	48/3.00	7/2.33	25.0	938	242	1,180	9,290	0.0851	553	213
380	50	382.0	49.5	431.5	240	54/3.00	7/3.00	27.0	1,056	397	1,458	12,310	0.0757	594	207
385	35	386.0	34.1	420.1	243	48/3.20	7/2.49	26.7	1,067	277	1,344	10,480	0.0748	597	211
435	55	434.3	56.3	490.6	273	54/3.20	7/3.20	28.8	1,203	450	1,653	13,645	0.0666	641	200
450	40	448.7	39.5	488.2	282	48/3.45	7/2.68	28.7	1,241	320	1,561	12,075	0.0644	650	205
490	65	490.3	63.6	553.9	308	54/3.40	7/3.40	30.6	1,356	510	1,866	15,310	0.0590	687	189
550	70	550.0	71.3	621.3	346	54/3.60	7/3.60	32.4	1,520	572	2,092	17,060	0.0526	734	168
560	50	561.7	49.5	611.2	353	48/3.86	7/3.00	32.2	1,553	401	1,954	14,895	0.05140	742	173
680	85	678.8	86.0	764.8	427	54/4.00	19/2.40	36.0	1,868	702	2,570	21,040	0.0426	830	80

Packing and Marking

The packing of the conductor is an integral part of the manufacturing process, and the kind of package must be predetermined before production can begin.

Unless otherwise specified or agreed with in case of order, ACSR shall be shipped on Taihan standard wooden reels having dimensions and weights as given in the table shown below.

Taihan standard wooden reels shall have enough condition to stand against the ordinary handling in transportation and shipping and be found ready and handy enough at the time of installation in site. Especially, in case that users require the metal reel, we can serve our standard metal reels which have the same capacity as that of the wooden reel or special designed metal reels.

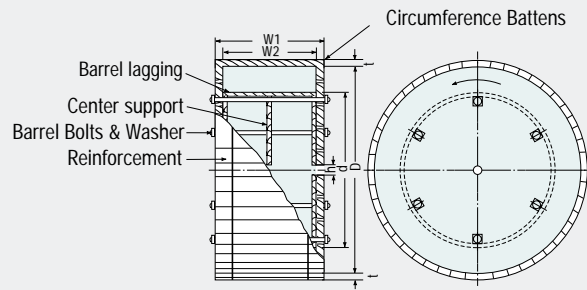
The reels will be stenciled legibly with following information; serial number, size and kind of conductor, length of conductor, and any other identification marks specified on the order by the purchaser.

Standard Dimensions of Reel for Aluminum Conductor

(Approx. in inch)

Reel Designation	Flange Dia. (D)	Drum Dia. (d)	Overall Width (W1)	Inside Traverse (W2)	Arbor Hole Dia. (h)	Thickness of Circumference Battens (t)	Dia. of Bolt (in)	No. of Bolt (No.)	Measurement (ft ²)	Approx. Weight (lb)
3-1	20.5	11.8	15.7	12.9	2.0	1.2	0.5	4	5.1	64.0
3-2	21.7	11.8	15.7	12.9	2.0	1.2	0.5	4	5.6	66.0
3-3	22.8	11.8	15.7	12.9	2.0	1.2	0.5	4	6.2	70.5
3-4	24.0	11.8	15.7	12.9	2.0	1.2	0.5	4	6.8	75.0
3-5	25.2	11.8	15.7	12.9	2.0	1.2	0.5	4	7.4	79.4
4-1	24.0	13.8	15.7	12.9	2.0	1.2	0.5	4	6.8	81.6
4-2	25.2	13.8	15.7	12.9	2.0	1.2	0.5	4	7.4	83.8
4-3	26.4	13.8	15.7	12.9	2.0	1.2	0.5	4	8.1	88.2
4-4	27.6	13.8	15.7	12.9	2.0	1.2	0.5	4	8.7	90.4
4-5	28.7	13.8	15.7	12.9	2.0	1.2	0.5	4	9.4	94.8
4-6	29.9	13.8	15.7	12.9	2.0	1.2	0.5	4	10.3	101.4
4-7	31.1	13.8	15.7	12.9	2.0	1.2	0.5	4	10.9	105.8
5-1	26.4	15.7	19.7	15.9	3.0	1.2	0.6	4	10.0	119.0
5-2	27.6	15.7	19.7	15.9	3.0	1.2	0.6	4	10.8	125.7
5-3	28.7	15.7	19.7	15.7	3.0	1.2	0.6	4	11.7	132.3
5-4	29.9	15.7	19.7	15.7	3.0	1.2	0.6	4	12.6	136.7
5-5	31.1	15.7	19.7	15.7	3.0	1.2	0.6	4	13.5	143.3
5-6	32.3	15.7	19.7	15.7	3.0	1.2	0.6	4	14.5	149.9
6-1	32.3	17.7	19.7	15.7	3.0	1.2	0.6	4	14.5	152.1
6-2	33.5	17.7	19.7	15.7	3.0	1.2	0.6	4	15.5	160.9
6-3	34.6	17.7	19.7	15.7	3.0	1.2	0.6	4	16.6	167.5
6-4	35.8	17.7	19.7	15.7	3.0	1.2	0.6	4	17.6	176.4
6-5	37.0	17.7	19.7	15.7	3.0	1.2	0.6	4	18.7	183.0
6-6	38.2	17.7	19.7	15.7	3.0	1.2	0.6	4	19.9	191.8
7-1	35.8	19.7	23.6	19.7	3.0	1.4	0.6	4	21.4	211.6
7-2	37.0	19.7	23.6	19.7	3.0	1.4	0.6	4	22.7	218.3
7-3	38.2	19.7	23.6	19.7	3.0	1.4	0.6	4	24.2	227.1
7-4	39.4	19.7	23.6	19.7	3.0	1.4	0.6	4	25.5	235.9
7-5	41.3	19.7	23.6	19.7	3.0	1.4	0.6	4	28.0	251.3
8-1	37.0	23.6	23.6	19.7	3.0	1.4	0.6	4	22.7	222.7
8-2	38.2	23.6	23.6	19.7	3.0	1.4	0.6	4	24.2	231.5
8-3	39.4	23.6	23.6	19.7	3.0	1.4	0.6	4	25.5	240.3
8-4	41.3	23.6	23.6	19.7	3.0	1.4	0.6	4	28.0	253.5
8-5	43.3	23.6	23.6	19.7	3.0	1.4	0.6	4	30.5	271.2
8-6	45.3	23.6	23.6	19.7	3.0	1.4	0.6	4	33.1	286.6
9-1	43.3	23.6	29.5	24.8	4.3	1.4	0.6	4	37.7	339.5
9-2	45.3	23.6	29.5	24.8	4.3	1.4	0.6	4	41.1	361.6
9-3	47.2	23.6	29.5	24.8	4.3	1.4	0.6	4	44.4	381.4
9-4	45.3	27.6	29.5	24.8	4.3	1.4	0.6	4	41.1	374.8
9-5	47.2	27.6	29.5	24.8	4.3	1.4	0.6	4	44.4	394.6
9-6	49.2	27.6	29.5	24.8	4.3	1.4	0.6	4	48.3	416.7
9-7	51.2	27.6	29.5	24.8	4.3	1.4	0.6	4	51.7	436.5
9-8	53.2	27.6	29.5	24.8	4.3	1.4	0.6	4	55.6	467.4

Dimensions of Wooden Reels



Standard Dimensions of Reel for Aluminum Conductor

(Approx. in inch)

Reel Designation	Flange Dia. (D)	Drum Dia. (d)	Overall Width (W1)	Inside Traverse (W2)	Arbor Hole Dia. (h)	Thickness of Circumference Battens (t)	Dia. of Bolt (in)	No. of Bolt (No.)	Measurement (ft ²)	Approx. Weight (lb)
10-1	49.2	31.5	29.5	24.8	4.3	1.4	0.6	4	48.2	445.3
10-2	51.2	31.5	29.5	24.8	4.3	1.4	0.6	4	51.8	465.2
10-3	53.2	31.5	29.5	24.8	4.3	1.4	0.6	4	55.6	487.2
10-4	55.1	31.5	29.5	24.8	4.3	1.4	0.6	4	59.6	509.3
10-5	57.1	31.5	29.5	24.8	4.3	1.4	0.6	4	63.6	533.5
10-6	59.1	31.5	29.5	24.8	4.3	1.4	0.6	4	68.1	557.8
11-1	55.1	31.5	35.4	29.5	4.3	1.4	0.6	5	71.1	615.5
11-2	57.1	31.5	35.4	29.5	4.3	1.4	0.6	5	75.8	650.4
11-3	59.1	31.5	35.4	29.5	4.3	1.4	0.6	5	81.0	681.2
11-4	61.0	31.5	35.4	29.5	4.3	1.4	0.6	5	86.1	709.9
11-5	63.1	31.5	35.4	29.5	4.3	1.4	0.6	5	94.6	743.0
12-1	55.1	35.4	35.4	29.5	4.3	1.4	0.6	5	71.1	643.7
12-2	57.1	35.4	35.4	29.5	4.3	1.4	0.6	5	75.8	672.4
12-3	59.1	35.4	35.4	29.5	4.3	1.4	0.6	5	81.0	701.1
12-4	61.0	35.4	35.4	29.5	4.3	1.4	0.6	5	86.1	731.9
12-5	63.0	35.4	35.4	29.5	4.3	1.4	0.6	5	92.0	765.0
13-1	59.1	39.4	35.4	29.5	4.3	1.8	0.6	5	83.1	784.8
13-2	61.0	39.4	35.4	29.5	4.3	1.8	0.6	5	88.4	820.1
13-3	63.0	39.4	35.4	29.5	4.3	1.8	0.6	5	93.8	851.0
13-4	65.0	39.4	35.4	29.5	4.3	1.8	0.6	5	99.5	888.5
13-5	66.9	39.4	35.4	29.5	4.3	1.8	0.6	5	105	921.5
13-6	68.9	39.4	35.4	29.5	4.3	1.8	0.6	5	111	956.8
13-7	70.9	39.4	35.4	29.5	4.3	1.8	0.6	5	117	994.3
14-1	66.9	47.2	41.3	34.3	4.3	1.8	0.7	6	123	1,170.6
14-2	68.9	47.2	41.3	34.3	4.3	1.8	0.7	6	130	1,210.3
14-3	70.9	47.2	41.3	34.3	4.3	1.8	0.7	6	137	1,258.8
14-4	72.8	47.2	41.3	34.3	4.3	1.8	0.7	6	144	1,322.8
14-5	74.8	47.2	41.3	34.3	4.3	1.8	0.7	6	152	1,342.6
14-6	76.8	47.2	41.3	34.3	4.3	1.8	0.7	6	160	1,391.1
14-7	78.7	47.2	41.3	34.3	4.3	1.8	0.7	6	168	1,435.2
15-1	74.8	55.1	41.3	34.3	4.3	1.8	0.7	6	152	1,404.3
15-2	76.8	55.1	41.3	34.3	4.3	1.8	0.7	6	160	1,459.4
15-3	78.7	55.1	41.3	34.3	4.3	1.8	0.7	6	168	1,503.5
15-4	82.7	55.1	41.3	34.3	4.3	1.8	0.7	6	184	1,627.0
16-1	78.3	55.1	47.2	40.2	4.3	1.8	0.7	8	191	1,607.2
16-2	82.7	55.1	47.2	40.2	4.3	1.8	0.7	8	209	1,706.4
16-3	86.6	55.1	47.2	40.2	4.3	1.8	0.7	8	228	1,805.6
16-4	90.6	55.1	47.2	40.2	4.3	1.8	0.7	8	250	1,913.6
17-1	82.7	62.8	47.2	40.2	4.3	1.8	0.7	8	209	1,882.7
17-2	86.6	62.8	47.2	40.2	4.3	1.8	0.7	8	229	1,935.6
17-3	90.6	62.9	47.2	40.2	4.3	1.8	0.7	8	249	1,995.2
17-4	94.5	62.9	47.2	40.2	4.3	1.8	0.7	8	271	2,105.4
17-5	98.4	62.9	47.2	40.2	4.3	1.8	0.7	8	293	2,220.0
17-6	102.4	62.9	47.2	40.2	4.3	1.8	0.7	8	316	2,341.3
18-1	90.6	70.9	47.2	40.2	4.3	1.8	0.7	8	249	2,079.0
18-2	94.5	70.9	47.2	40.2	4.3	1.8	0.7	8	271	2,191.4
18-3	98.4	70.9	47.2	40.2	4.3	1.8	0.7	8	293	2,306.0
18-4	102.4	70.9	47.2	40.2	4.3	1.8	0.7	8	316	2,427.3

Comparison of Aluminum and Copper

Item	Aluminum		Copper	
	Hard-drawn	Al-alloy	Hard-drawn	Annealed Standard
Melting Point, °C	658	Approx. 650	1.083	1.083
Electrical Resistivity at 20 °C, $\mu\Omega \cdot \text{in}$ $\mu\Omega \cdot \text{cm}$	1.11277	1.30536	0.69978	0.67879
	2.8264	3.3156	1.7774	1.7241
Conductivity at 20 °C, % IACS	61	52	97	100
Temperature Coefficient of Resistance at 20 °C, per °C	0.0040	0.0036	0.00381	0.00393
Density at 20 °C, g/cub, cm lb/cub, in	2.70	2.70	8.89	8.89
	0.09765	0.09765	0.321	0.321
Coefficient of Linear Expansion per °C	23×10^{-6}	23×10^{-6}	17×10^{-6}	17×10^{-6}
Weight Ratio, Same Volume	30.371	30.371	100	100
Resistance Ratio, Same Size	163.93	192.30	103.09	100
	159.01	186.54	100	
Resistance Ratio, Same Length and Same Weight	48.29	56.65	100	
Tensile Strength Ratio	Approx. 40	Approx. 73	100	
For Same Length and Resistance, Cross Sectional Area	159.01	185.54	100	
	Diameter	126.12	136.58	100
	Weight	48.295	56.653	100
	Breaking Strength	Approx. 60	Approx. 135	100

Conversion Factors

1in = 25.4mm, 1cmil = 5.067×10^{-4} mm², 1mil = 2.54×10^{-2} mm, 1lb/1000ft = 1.488kg/km,
1ft = 3.048×10^{-1} m, 1lb = 4.536×10^{-1} kg, 1in³ = 1.639×10^{-5} m³

The metric unit of force in SI(System International) units is the newton. (N), which is defined as that force which, when applied to a body having a mass of 1kg, gives it an acceleration of 1m/s².

The derived SI unit for pressure or stress is the newton per square meter(N/m²), which has been named the pascal(Pa) by the General Conference of Weights and Measures. Since 1ksi=6894757Pa the metric equivalents are expressed as megapascal(MPa), which is the same as Mn/m² and N/mm².

$$1\text{ksi} = 10^3\text{psi}$$

$$1\text{psi} = 6.9\text{KPa}$$

$$1\text{ksi} = 6.9\text{MPa}$$

$$1\text{kgf/mm}^2 = 1.42\text{ksi}$$

$$1\text{ksi} = 0.704\text{kgf/mm}^2$$

$$\text{kgf} = 9.80665 \times \text{newtons(N)}$$