

APPLICATION

The galvanized single steel wires or stranded steel wires are suitable for cores of ACSR to improve its tensile strength. And they can also be used in the aerial transmission line as the line material of ground connection to avoid the lightning strike.

DESCRIPTION

Bare concentric-lay-stranded conductors are made from bare, hard-drawn, round, aluminum clad steel wires for general use of electrical purposes. Tensile strength and zinc-clad of steel wire have different grades.

SPECIFICATIONS

- IEC 61089 Round Wire Concentric Lay Overhead Electrical Stranded Conductors
- ASTM A 475 Zinc-Coated Steel Wire Strand
- BS 183 General Purpose Galvanized Steel Wire Strand
- AS 1222.1 Steel Conductors and Stays—Bare overhead Part 1: Galvanized (SC/GZ)
- GB/T 1179 Round Wire Concentric Lay Overhead Electrical Stranded Conductors

Parameter
ASTM A 475

Nominal diameter of strand		Number of Wires in Strand	Nominal Diameter of Coated Wire in Strand	Approx. weight of strand	Minimum Breaking Strength of Strand				
					Utilities Grade	Common Grade	Siemens-Martin Grade	High-Strength Grade	Extra-high Strength Grade
In.	mm		mm	kg/km	kN	kN	kN	kN	kN
1/8	3.18	7	1.04	48	-	2.402	4.048	5.916	8.140
5/32	3.97	7	1.32	76	-	3.870	6.539	9.519	13.078
3/16	4.76	7	1.57	109	-	5.115	8.452	12.677	17.748
3/16	4.76	7	1.65	119	10.676	-	-	-	-
7/32	5.56	3	2.64	131	-	6.228	10.409	15.569	21.796
7/32	5.56	7	1.83	146	-	6.850	11.387	17.126	24.020
1/4	6.35	3	3.05	174	14.012	8.274	13.523	21.040	29.981
1/4	6.35	3	3.05	174	20.017	-	-	-	-
1/4	6.35	7	2.03	180	-	8.452	14.012	21.129	29.581
9/32	7.14	3	3.30	204	-	9.252	15.035	23.398	33.362
9/32	7.14	7	2.36	244	20.462	11.432	18.905	28.469	39.812
5/16	7.94	3	3.68	255	28.913	11.076	18.193	28.246	40.479
5/16	7.94	7	2.64	305	-	14.234	23.798	35.586	49.820
5/16	7.94	7	2.77	335	26.689	-	-	-	-
3/8	9.52	3	4.19	328	37.810	14.813	24.732	37.187	52.489
3/8	9.52	7	3.05	407	51.155	18.905	30.915	48.040	68.503
7/16	11.11	7	3.68	595	80.068	25.355	41.591	64.499	92.523
1/2	12.70	7	4.19	770	111.206	32.917	53.823	83.627	119.657

1/2	12.70	19	2.54	751	-	33.895	56.492	84.961	118.768
9/16	14.29	7	4.78	1000	-	42.703	69.837	108.981	155.688
9/16	14.29	19	2.87	949	-	42.881	71.616	107.202	149.905
5/8	15.88	7	5.26	1211	-	51.599	84.961	131.667	188.605
5/8	15.88	19	3.18	1186	-	48.930	80.513	124.995	178.819
3/4	19.05	19	3.81	1721	-	71.172	116.543	181.487	259.331
7/8	22.22	19	4.50	2356	-	97.416	159.691	248.211	354.523
1	25.40	19	5.08	3089	-	127.664	209.066	325.610	464.839
1	25.40	37	3.63	3065	-	125.885	205.508	319.827	456.832
1 1/8	28.58	37	4.09	4010	-	160.136	262.000	407.457	581.827
1 1/4	31.75	37	4.55	4840	-	198.391	324.720	505.318	721.502

Note: Class A and Class B and Class C are in same structure.

BS 183

Construction Number of wires/wire diameter	Approximate strand diameter	Minimum breaking load of strand							Approx. mass
		Grade 350	Grade 480	Grade 700	Grade 850	Grade 1000	Grade 1150	Grade 1300	
	mm	kN	kN	kN	kN	kN	kN	kN	kg/1000 m
3/1.80	3.9	2.65	3.66	—	—	—	—	—	60
3/2.65	5.7	5.80	7.95	—	—	—	—	—	130
3/3.25	7.0	8.70	11.95	—	—	—	—	—	195
3/4.00	8.6	13.20	18.10	—	—	—	—	—	295
4/1.80	4.4	3.55	4.90	—	—	—	—	—	80
4/2.65	6.4	7.70	10.60	—	—	—	—	—	172
4/3.25	7.9	11.60	15.90	—	—	—	—	—	260
4/4.00	9.7	17.60	24.10	35.20	—	—	—	—	390
5/1.50	4.1	3.10	4.24	6.18	—	—	—	—	69
5/1.80	4.9	4.45	6.10	8.90	—	—	—	—	95
5/2.65	7.2	9.65	13.25	19.30	—	—	—	—	220
5/3.25	8.8	14.50	19.90	29.00	—	—	—	—	320
5/4.00	10.8	22.00	30.15	43.95	—	—	—	—	490
7/0.56	1.7	0.60	0.83	1.20	—	1.70	1.98	2.24	14
7/0.71	2.1	0.97	1.33	1.94	—	2.75	3.19	3.60	28

7/0.85	2.6	1.39	1.90	2.80	—	3.95	4.57	5.15	31
7/0.90	2.7	1.55	2.14	3.10	—	4.45	5.12	5.80	35
7/1.00	3.0	1.92	2.64	3.85	—	5.50	6.32	7.15	43
7/1.25	3.8	3.01	4.10	6.00	—	8.55	9.88	11.15	67
7/1.40	4.2	3.75	5.17	7.54	9.16	10.75	12.35	14.00	84
7/RSa	4.3	3.85	5.28	7.70	9.35	11.00	12.65	14.30	86
7/1.60	4.8	4.90	6.75	9.85	11.95	14.10	16.20	18.30	110
7/1.80	5.4	6.23	8.55	12.45	—	17.80	20.50	23.20	140
7/2.00	6.0	7.70	10.55	15.40	—	22.00	25.30	28.60	170
7/2.36	7.1	10.70	14.70	21.40	—	30.60	35.20	39.80	240
7/2.65	8.0	13.50	18.50	27.00	—	38.60	44.40	50.20	300
7/3.00	9.0	17.30	23.75	34.65	—	49.50	56.90	64.30	392
7/3.15	9.5	19.10	26.20	38.20	—	54.55	62.75	70.90	430
7/3.25	9.8	20.30	27.85	40.65	—	58.05	66.80	75.50	460
7/3.65	11.0	25.60	35.15	51.25	—	73.25	84.20	95.20	570
7/4.00	12.0	30.90	42.20	61.60	—	88.00	101.0	114.0	690
7/4.25	12.8	34.75	47.65	69.50	—	99.30	114.0	129.0	780
7/4.75	14.0	43.40	59.45	86.80	—	124.0	142.7	161.3	970
19/1.00	5.0	5.22	7.16	10.45	—	14.92	17.16	19.40	120

Construction Number of wires/wire diameter	Approximate strand diameter	Minimum breaking load of strand							Approx. mass
		Grade 350	Grade 480	Grade 700	Grade 850	Grade 1000	Grade 1150	Grade 1300	
	mm	kN	kN	kN	kN	kN	kN	kN	kg/1000 m
19/1.25	6.3	8.16	11.19	16.32	—	23.32	26.81	30.31	180
19/1.40	7.0	10.24	14.04	20.47	—	29.25	33.64	38.02	230
19/1.60	8.0	13.37	18.34	26.75	—	38.20	43.93	49.66	300
19/2.00	10.0	20.90	28.65	41.78	50.74	59.69	68.64	77.60	470
19/2.50	12.5	32.65	44.80	65.29	79.28	93.27	107.3	121.3	730
19/3.00	15.0	47.00	64.50	94.00	114.1	134.3	154.5	174.6	1050
19/3.55	17.8	65.80	90.27	131.6	159.9	188.0	216.3	244.5	1470
19/4.00	20.0	83.55	114.6	167.1	203.0	238.7	274.6	310.4	1870
19/4.75	23.8	117.85	161.6	235.7	286.0	336.7	387.2	437.7	2630

a The construction of this strand consists of six wires of 1.40 mm diameter on a centre wire of 1.50 mm diameter. The diameter of the centre wire shall not be less than 0.08 mm nor more than 0.12 mm greater than the diameter of the outer wire.

AS 1222.1

Standing and wire diameter	Approx. overall diameter	Cross-section area	Approx. mass per km	Calculated breaking load (CBL)	Equivalent aluminium area	Typical d.c. resistance per km at 20°C
mm	mm	mm ²	kg	kN	mm ²	Ω
3/2.00	4.31	9.426	74	11.7	1.4	20
3/2.75	5.93	17.82	140	22.2	2.6	11
7/2.00	6.00	21.99	173	26.0	3.2	8.7
7/2.75	8.25	41.58	328	49.0	6.1	4.6
7/3.25	9.75	58.07	458	68.7	8.6	3.3
7/3.75	11.3	77.28	609	91.3	11	2.5
19/2.00	10.0	59.70	473	70.5	8.8	3.2
19/2.75	13.8	112.9	894	133	17	1.7
19/3.25	16.3	157.6	1250	186	23	1.2

GB/T 1179

Code Number	Area mm ²	Number of wires	Diameter mm		Linear Mass kg/km	Rated strength kN					DC resistance Ω/km
			Wire	Cond.		JG1A	JG2A	JG3A	JG4A	JG5A	
10	10.8	7	1.40	4.20	84.8	14.44	15.62	17.46	20.15	21.12	17.9754
15	17.8	7	1.80	5.40	140.1	23.87	25.83	28.86	33.31	34.91	10.8740
20	22.0	7	2.00	6.00	173.0	29.47	31.89	35.63	41.12	43.10	8.8079
25	26.6	7	2.20	6.60	209.3	35.66	38.58	43.11	49.76	52.15	7.2793
35	37.2	7	2.60	7.80	292.4	48.69	52.40	59.09	67.64	70.99	5.2118
40	38.2	19	1.60	8.00	301.9	51.19	55.39	61.89	71.44	74.88	5.0939
50	49.5	7	3.00	9.00	389.2	64.82	69.77	78.67	90.05	94.51	3.9146
50	48.3	19	1.80	9.00	382.1	64.79	70.11	78.33	90.41	94.76	4.0248
55	56.3	7	3.20	9.60	442.9	72.62	79.38	87.26	99.65	105.3	3.4406
60	59.7	19	2.00	10.0	471.7	79.98	86.55	96.70	111.6	117.0	3.2601
65	67.3	7	3.50	10.5	529.8	86.88	94.96	104.4	119.2	125.9	2.8761
70	72.2	19	2.20	11.0	570.8	96.78	104.73	117.00	135.1	141.6	2.6943
75	74.4	37	1.60	11.2	589.4	99.7	107.9	120.5	139.1	145.8	2.6225
80	79.4	7	3.80	11.4	624.5	102.4	109.6	120.7	136.5	144.5	2.4399
80	78.9	19	2.30	11.5	623.9	103.4	111.3	125.5	143.7	150.8	2.4651

90	88.0	7	4.00	12.0	692.0	113.5	121.4	133.7	151.3	160.1	2.2020
95	94.8	19	2.52	12.6	748.9	124.14	133.62	150.68	172.5	181.0	2.0535
100	101	19	2.60	13.0	797.2	132.1	142.2	160.4	183.6	192.7	1.9291
115	116	37	2.00	14.0	921.0	155.8	168.5	188.3	217.4	227.8	1.6784
125	125	19	2.90	14.5	991.8	164.4	177.0	199.5	228.4	239.7	1.5506
150	153	19	3.20	16.0	1207.6	197.1	215.5	236.9	270.5	285.7	1.2735
155	154	37	2.30	16.1	1218.0	201.4	216.8	244.4	279.8	293.6	1.2691
185	183	19	3.50	17.5	1444.7	235.8	257.8	283.3	323.6	341.8	1.0645
200	196	37	2.60	18.2	1556.5	257.3	277.0	312.3	357.5	375.2	0.9931
240	239	19	4.00	20.0	1886.9	308.0	329.5	362.9	410.7	434.5	0.8150
245	244	37	2.90	20.3	1936.4	320.2	344.6	388.6	444.8	466.8	0.7983
300	298	37	3.20	22.4	2357.7	383.9	419.6	461.2	526.7	556.5	0.6556
355	356	37	3.50	24.5	2820.5	459.2	501.9	551.8	630.1	665.7	0.5480
465	465	37	4.00	28.0	3683.9	599.8	641.6	706.7	799.7	846.2	0.4196