

Product Description

Application

The galvanized steel wire strand is used for overhead ground lines or electrical power transmission lines. Stay or guy wire strands are produced for use with poles, towers, or any other form of guying.

The galvanized single steel wires also named Guy Wire, Earth wire with Galvanised Steel Wire (GSW) or Aluminium Clad steel (ACS) & Stay Wire 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.

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.

- Pole and tower support systems
- Overhead line guying and anchoring
- Grounding and earthing networks
- Shielding earth wires for transmission lines
- Infrastructure requiring mechanical stability and structural reinforcement

Standard

Specification

- 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

Construction

Concentrically stranded Galvanized steel wire strand available in class "A", "B" and "C" galvanizing, "A" being the least heavy and "C" being the most heavy. Manufactured without welds per ASTM A-363 or with welds per ASTM A-475. Strands are formed to remain substantially in place when severed.

Construction Parameters

ASTM A 475

Nominal diameter of strand		Number of Wires in Strand	Nominal Diameter of Coated Wire in Strand	Approx. weight of strand	Minimun 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

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					Utilities Grade	Common Grade	Siemens-Martin Grade	High-Strength Grade	Extra-high Strength Grade
In.	mm		mm	kg/km	kN	kN	kN	kN	kN
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.
		Grade 350	Grade 480	Grade 700	Grade 850	Grade 1000	Grade 1150	Grade 1300	mass
	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	5.8	7.95	—	—	—	—	—	130
3/3.25	7	8.7	11.95	—	—	—	—	—	195
3/4.00	8.6	13.2	18.1	—	—	—	—	—	295
4/1.80	4.4	3.55	4.9	—	—	—	—	—	80
4/2.65	6.4	7.7	10.6	—	—	—	—	—	172
4/3.25	7.9	11.6	15.9	—	—	—	—	—	260
4/4.00	9.7	17.6	24.1	35.2	—	—	—	—	390
5/1.50	4.1	3.1	4.24	6.18	—	—	—	—	69
5/1.80	4.9	4.45	6.1	8.9	—	—	—	—	95
5/2.65	7.2	9.65	13.25	19.3	—	—	—	—	220
5/3.25	8.8	14.5	19.9	29	—	—	—	—	320
5/4.00	10.8	22	30.15	43.95	—	—	—	—	490
7/0.56	1.7	0.6	0.83	1.2	—	1.7	1.98	2.24	14
7/0.71	2.1	0.97	1.33	1.94	—	2.75	3.19	3.6	28
7/0.85	2.6	1.39	1.9	2.8	—	3.95	4.57	5.15	31
7/0.90	2.7	1.55	2.14	3.1	—	4.45	5.12	5.8	35
7/1.00	3	1.92	2.64	3.85	—	5.5	6.32	7.15	43
7/1.25	3.8	3.01	4.1	6	—	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	84
7/RSa	4.3	3.85	5.28	7.7	9.35	11	12.65	14.3	86
7/1.60	4.8	4.9	6.75	9.85	11.95	14.1	16.2	18.3	110
7/1.80	5.4	6.23	8.55	12.45	—	17.8	20.5	23.2	140
7/2.00	6	7.7	10.55	15.4	—	22	25.3	28.6	170
7/2.36	7.1	10.7	14.7	21.4	—	30.6	35.2	39.8	240
7/2.65	8	13.5	18.5	27	—	38.6	44.4	50.2	300
7/3.00	9	17.3	23.75	34.65	—	49.5	56.9	64.3	392
7/3.15	9.5	19.1	26.2	38.2	—	54.55	62.75	70.9	430
7/3.25	9.8	20.3	27.85	40.65	—	58.05	66.8	75.5	460
7/3.65	11	25.6	35.15	51.25	—	73.25	84.2	95.2	570
7/4.00	12	30.9	42.2	61.6	—	88	101	114	690
7/4.25	12.8	34.75	47.65	69.5	—	99.3	114	129	780
7/4.75	14	43.4	59.45	86.8	—	124	142.7	161.3	970
19/1.00	5	5.22	7.16	10.45	—	14.92	17.16	19.4	120

Construction Number of wires/wire diameter	Approximate strand diameter	Minimum breaking load of strand							Approx.
		Grade 350	Grade 480	Grade 700	Grade 850	Grade 1000	Grade 1150	Grade 1300	mass

	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	10.24	14.04	20.47	—	29.25	33.64	38.02	230
19/1.60	8	13.37	18.34	26.75	—	38.2	43.93	49.66	300
19/2.00	10	20.9	28.65	41.78	50.74	59.69	68.64	77.6	470
19/2.50	12.5	32.65	44.8	65.29	79.28	93.27	107.3	121.3	730
19/3.00	15	47	64.5	94	114.1	134.3	154.5	174.6	1050
19/3.55	17.8	65.8	90.27	131.6	159.9	188	216.3	244.5	1470
19/4.00	20	83.55	114.6	167.1	203	238.7	274.6	310.4	1870
19/4.75	23.8	117.85	161.6	235.7	286	336.7	387.2	437.7	2630

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	21.99	173	26	3.2	8.7
7/2.75	8.25	41.58	328	49	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	59.7	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

IEC 60189

Code No.	Section Area	No./Dia of Wire	Approx. Overall Diameter	Approx. Weight	Breaking Load				DC Resistance at 20°C Max.
					S1A	S1B	S2A	S3A	
	mm ²	No./mm	mm	kg/km	kN	kN	kN	kN	Ohm/km
4	27.1	7/2.22	6.66	213.3	36.3	33.6	39.3	43.9	7.1445
6.3	42.7	7/2.79	8.36	335.9	55.9	51.7	60.2	67.9	4.5362
10	67.8	7/3.51	10.53	553.2	87.4	80.7	93.5	103.0	2.8578
12.5	84.7	7/3.93	11.78	666.5	109.3	100.8	116.9	128.8	2.2862
16	108.4	7/4.44	13.32	853.1	139.9	129.0	199.7	164.8	1.7861
16	108.4	19/2.70	13.48	857.0	142.1	131.2	152.9	172.4	1.7944
25	169.4	19/3.37	16.85	1339.1	218.6	201.6	238.9	262.6	1.1484
40	271.1	19/4.26	21.31	2141.6	349.7	322.6	374.1	412.1	0.7177
40	271.1	37/3.05	21.38	2148.1	349.7	322.6	382.3	420.2	0.7196
63	427.0	37/3.83	26.83	3383.2	550.8	508.1	589.3	649.0	0.4569