

CCS Conductor Wire

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CCS – Copper Clad Steel Wire 30% CCS Overview

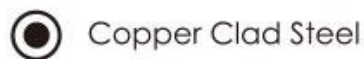
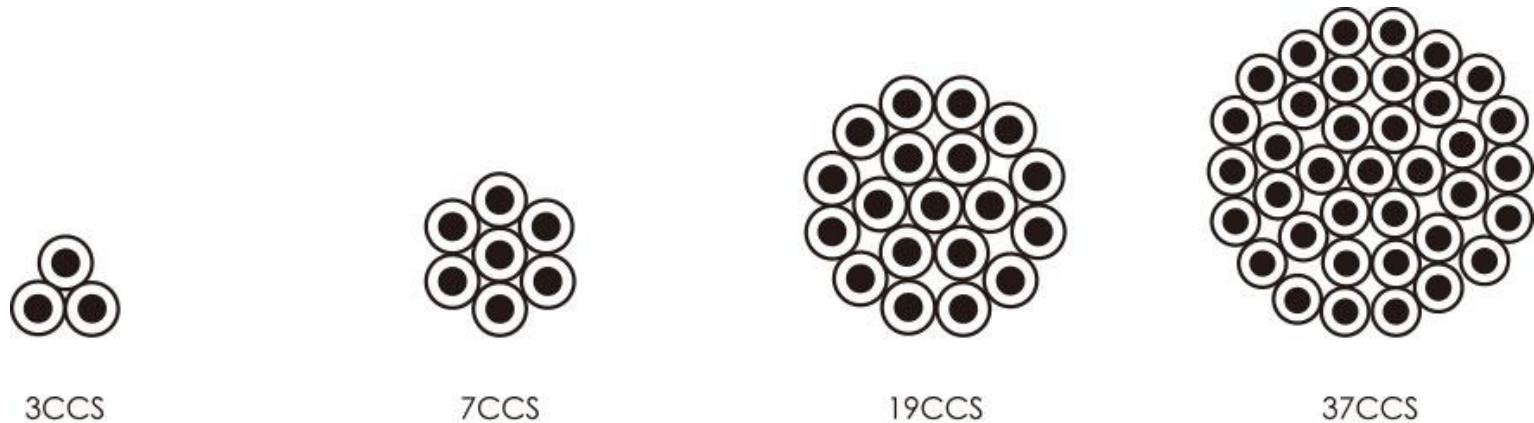
Application

Copper clad steel wire is composed of stranded copper clad monofilament, widely applied for grounding and lightning protection, electrostatic grounding protection, protective grounding, grounding wire of electrical and petrochemical system in areas covering high-frequency coaxial cable, electrified railway, metro, railways, airport, network communication etc. These wire and cables are available in 30% and 40% electric productivity based on different copper thickness.

Standard

Basic design to 30% CCS Overview

Construction



Construction Parameters

COND UCTO R SIZE	STR AND S	STRAND DIAMETER		OVERALL DIAMETER		AREA		FAUI CUR REN T	WEIGHT/LENG TH		WIRE RESISTANCE		MIN.BREAK LOAD	
AWG		IN.	MM	IN.	MM	CMIL	(MM ²)	AMP SAT 0.5 SEC.	LBS/K FT	KG/K M	Q/KF T	Q/KM	LBF	KGf
19#4	19	0.2043	5.19	1.022	25.95	793,000	401.8	92.96	2346.4	3491.8	0.0451	0.1479	24474	11101
19#5	19	0.1819	4.62	0.91	23.1	628,700	318.6	73.7	1860.1	2768.1	0.0569	0.1866	19402	8800
19#6	19	0.162	4.11	0.81	20.57	498,600	252.6	58.45	1475.3	2195.5	0.0717	0.2352	15389	6980
19#7	19	0.144	3.6	0.72	18.3	395,600	200.5	46.3	1170.6	1742	0.090	0.296	1221	5538

		3	7	2	3	0		8			4	5	0	
19#8	19	0.128 5	3.2 6	0.64 3	16.3 2	313,70 0	159	36.7 8	928.3	1381. 4	0.114	0.373 9	9682	4392
19#9	19	0.114 4	2.9 1	0.57 2	14.5 3	248,70 0	126	29.1 5	735.7	1094. 9	0.143 8	0.471 7	7674	3481
4/0	19	0.105 5	2.6 8	0.52 8	13.4	211,50 0	107.2	24.7 9	625.7	931.1	0.169 1	0.554 7	6526	2960
19#10	19	0.101 9	2.5 9	0.51	12.9 4	197,30 0	100	23.1 3	583.7	868.7	0.181 2	0.594 6	6089	2762
7#4	7	0.204 3	5.1 9	0.61 3	15.5 7	292,20 0	148.1	34.2 5	861	1281. 4	0.121 9	0.399 9	9017	4090
7#5	1	0.181 9	4.6 2	0.54 6	13.8 6	231,60 0	117.4	27.1 5	682.6	1015. 8	0.153 8	0.504 5	7148	3242
7#6	1	0.162	4.11	0.48 6	12.3 4	183,70 0	93.1	21.5 4	541.4	805.7	0.193 9	0.636	5670	2572
7#7	1	0.144 3	3.6 7	0.43 3	11	145,80 0	73.9	17.0 9	429.6	639.3	0.244 3	0.801 6	4498	2040
2/0	7	0.137 9	3.5	0.41 4	10.5 1	133,10 0	67.4	15.6	392.3	583.8	0.267 5	0.877 7	4108	1863
7#8	1	0.128 5	3.2 6	0.38 6	9.79	115,60 0	58.6	13.5 5	340.6	506.9	0.308 1	1.010 8	3567	1618
1/0	7	0.122 8	3.1 2	0.36 8	9.35	105,60 0	53.5	12.3 7	311.1	463	0.337 4	1.106 9	3258	1478
7#9	7	0.114 4	2.9 1	0.34 3	8.72	91,610	46.4	10.7 4	270	401.8	0.388 7	1.275 4	2827	1282
7#10	7	0.101 9	2.5 9	0.30 6	7.76	72,690	36.8	8.52	214.2	318.8	0.490 0	1.607 5	2243	1017
3#4	3	0.204 3	5.1 9	0.44	11.1 8	125,20 0	63.4	14.6 8	368.3	548.1	0.283 8	0.931 3	4079	1850
3#5	3	0.181 9	4.6 2	0.39 2	9.96	99,260	50.3	11.64	292	434.5	0.358 1	1.174 7	3234	1467

3#6	3	0.162	4.11	0.34 9	8.86	78,730	39.9	9.23	231.6	344.6	0.451 4	1.481 1	2565	1163
3#7	3	0.144 3	3.6 7	0.31 1	7.9	62,470	31.7	7.32	183.7	273.4	0.569	1.866 7	2035	923
3#8	3	0.128 5	3.2 6	0.27 7	7.04	49,540	25.1	5.81	145.7	216.8	0.717 5	2.354	1614	732
3#9	3	0.114 4	2.9 1	0.24 7	6.27	39,260	19.9	4.6	115.5	171.9	0.905 3	2.97	1279	580
3#10	3	0.101 9	2.5 9	0.22	5.59	31,150	15.8	3.65	91.6	136.3	1.141	3.743 3	1015	460
#2AW G	7	0.086	2.1 8	0.25 8	6.55	51,770	26.2	6.07	152.6	227.1	0.687 9	2.256 8	1614	732
#4AW G	1	0.068	1.7 3	0.20 4	5.18	32,370	16.4	3.79	95.4	142	1.100 2	3.609 7	1009	458
#2AW G	1	0.257 6	6.5 4	0.25 8	6.54	66,370	33.6	7.78	193.7	288.2	0.531 3	1.743	2276	1032
#4AW G	1	0.204 3	5.1 9	0.20 4	5.19	41,740	21.2	4.89	121.8	181.2	0.844 8	2.771 6	1431	649
#6AW G	1	0.162	4.1 2	0.16 2	4.12	26,250	13.3	3.08	76.6	114	1.343 2	4.406 9	900	408
#8Aw G	1	0.128 5	3.2 6	0.12 9	3.26	16,510	8.4	1.94	48.2	71.7	2.135 4	7.005 9	566	257
#9Aw G	1	0.114 4	2.9 1	0.11 4	2.91	13,090	6.6	1.53	38.2	56.8	2.694 2	8.839 3	449	204
#10Aw G	1	0.101 9	2.5 9	0.10 2	2.59	10,38	5.3	1.22	30.3	45.1	3.395 7	11.14 09	356	162

CCS – Copper Clad Steel Wire 40% CCS Overview

Application

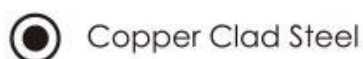
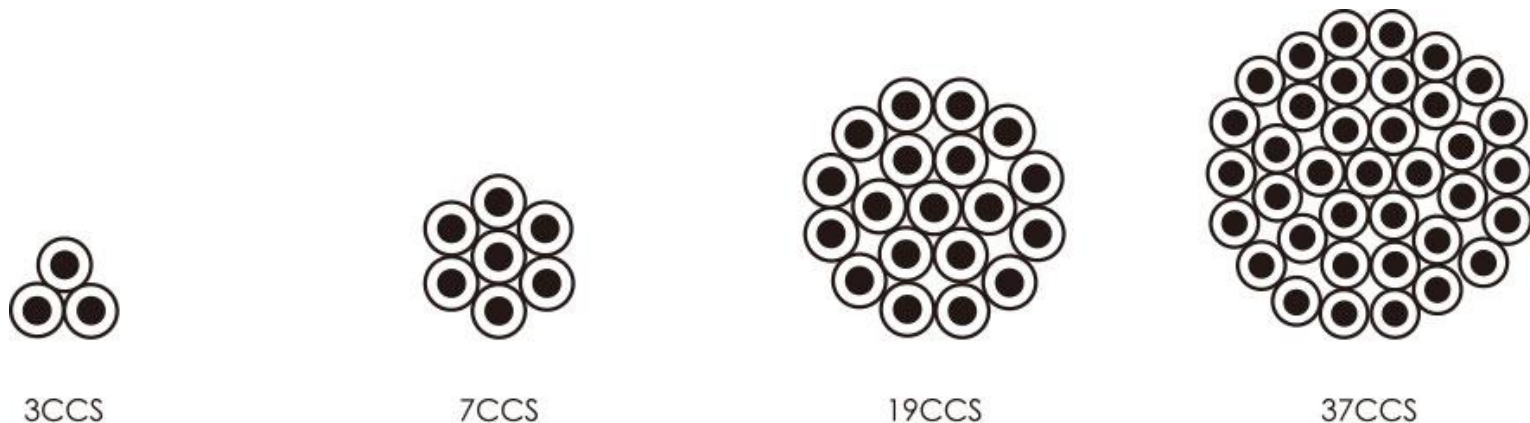
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electrified railway, metro, railways, airport, network communication etc. These wire and cables are available in 30% and 40% electric productivity based on different copper thickness.

Standard

Basic design to 40% CCS Overview

Construction



Construction Parameters

CONDUCTOR SIZE	STRA NDS	STRAND DIAMETER		OVERALL DIAMETER		AREA		FAUIT CURRE NT	WEIGHT/LENGT H		WIRE RESISTANC E		MIN.BREAK LOAD	
AWG		IN.	MM	IN.	MM	CMI L	(MM^ 2)	AMPSA T 0.5 SEC.	LBS/KF T	KG/K M	/KF T	Q/KM	LBF	KGF
19#4	19	0.2043	5.19	1.022	25.95	793,000	401.8	107.28	2251.7	3350.9	0.0338	0.111	21755	9868
19#5	19	0.1819	4.62	0.91	23.1	628,700	318.6	85.05	1785	2656.3	0.0427	0.14	17246	7823
19#6	19	0.162	4.11	0.81	20.57	498,600	252.6	67.46	1415.8	2106.9	0.0538	0.1765	13679	6205
19#7	19	0.1443	3.67	0.722	18.33	395,600	200.5	53.52	1123.3	1671.7	0.0678	0.2224	10853	4923

19#8	19	0.12 85	3.2 6	0.6 43	16.3 2	313, 700	159	42.44	890.8	1325. 6	0.0 85 5	0.280 5	8606	3904
19#9	19	0.11 44	2.9 1	0.5 72	14.5 3	248, 700	126	33.64	706	1050. 7	0.1 07 9	0.353 9	6821	3094
4/0	19	0.10 55	2.6 8	0.5 28	13.4	211, 500	107.2	28.61	600.4	893.6	0.1 26 8	0.416 1	5801	2631
19#10	19	0.10 19	2.5 9	0.5 1	12.9 4	197, 300	100	26.69	560.2	833.6	0.1 35 9	0.446	5412	2455
7#4	7	0.20 43	5.1 9	0.6 13	15.5 7	292, 200	148.1	39.53	826.3	1229. 7	0.0 91 4	0.3	8015	3635
7#5	7	0.18 19	4.6 2	0.5 46	13.8 6	231, 600	117.4	31.33	655	974.8	0.1 15 3	0.378 4	6354	2882
7#6	7	0.16 2	4.11	0.4 86	12.3 4	183, 700	93.1	24.85	519.6	773.2	0.1 45 4	0.477 1	5040	2286
7#7	7	0.14 43	3.6 7	0.4 33	11	145, 800	73.9	19.72	412.2	613.5	0.1 83 3	0.601 3	3998	1814
2/0	7	0.13 79	3.5	0.4 14	10.5 1	133, 100	67.4	18.01	376.5	560.2	0.2 00 7	0.658 4	3652	1656
7#8	7	0.12 85	3.2 6	0.3 86	9.79	115, 600	58.6	15.64	326.9	486.5	0.2 311	0.758 3	3171	1438
1/0	7	0.12 28	3.1 2	0.3 68	9.35	105, 600	53.5	14.28	298.5	444.3	0.2 53 1	0.830 3	2896	1313
7#9	7	0.11 44	2.9 1	0.3 43	8.72	91,6 10	46.4	12.39	259.1	385.6	0.2 91	0.956 7	2513	1140

											6			
7#10	7	0.10 19	2.5 9	0.3 06	7.76	72,6 90	36.8	9.83	205.6	305.9	0.3 67 5	1.205 8	1994	904
3#4	3	0.20 43	5.1 9	0.4 4	11.1 8	125, 200	63.4	16.94	353.4	526	0.2 12 9	0.698 6	3626	1645
3#5	3	0.18 19	4.6 2	0.3 92	9.96	99,2 60	50.3	13.43	280.2	416.9	0.2 68 6	0.881 2	2874	1304
3#6	3	0.16 2	4.11	0.3 49	8.86	78,7 30	39.9	10.65	222.2	330.7	0.3 38 6	1.111	2280	1034
3#7	3	0.14 43	3.6 7	0.3 11	7.9	62,4 70	31.7	8.45	176.3	262.4	0.4 26 8	1.400 3	1809	820
3#8	3	0.12 85	3.2 6	0.2 77	7.04	49,5 40	25.1	6.7	139.8	208.1	0.5 38 2	1.765 8	1434	651
3#9	3	0.11 44	2.9 1	0.2 47	6.27	39,2 60	19.9	5.31	110.8	164.9	0.6 79 1	2.227 9	1137	516
3#10	3	0.10 19	2.5 9	0.2 2	5.59	31,1 50	15.8	4.21	87.9	130.8	0.8 55 9	2.808	902	409
#2AWG	7	0.08 6	2.1 8	0.2 58	6.55	51,7 70	26.2	7	146.4	217.9	0.5 16	1.692 9	1435	651
#4AwG	7	0.06 8	1.7 3	0.2 04	5.18	32,3 70	16.4	4.38	91.5	136.2	0.8 25 3	2.707 8	897	407
#2AwG	1	0.25 76	6.5 4	0.2 58	6.54	66,3 70	33.6	8.98	185.8	276.6	0.3 98 5	1.307 5	2023	918
#4AWG	1	0.20	5.1	0.2	5.19	41,7	21.2	5.65	116.9	173.9	0.6	2.079	1272	577

		43	9	04		40					33	1		
											7			
#6AWG	1	0.16 2	4.1 2	0.1 62	4.12	26,2 50	13.3	3.55	73.5	109.4	1.0 07 6	3.305 8	800	363
#8AWG	1	0.12 85	3.2 6	0.1 29	3.26	16,5 10	8.4	2.23	46.2	68.8	1.6 01 8	5.255 4	503	228
#9AWG	1	0.11 44	2.9 1	0.1 14	2.91	13,0 90	6.6	1.77	36.6	54.5	2.0 21	6.630 7	399	181
#10Aw G	1	0.10 19	2.5 9	0.1 02	2.59	10,3 80	5.3	1.4	29.1	43.3	2.5 47 3	8.357 2	316	144

CCS – Copper Clad Steel Wire ASTM-B227 B228

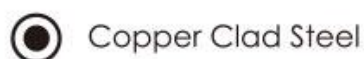
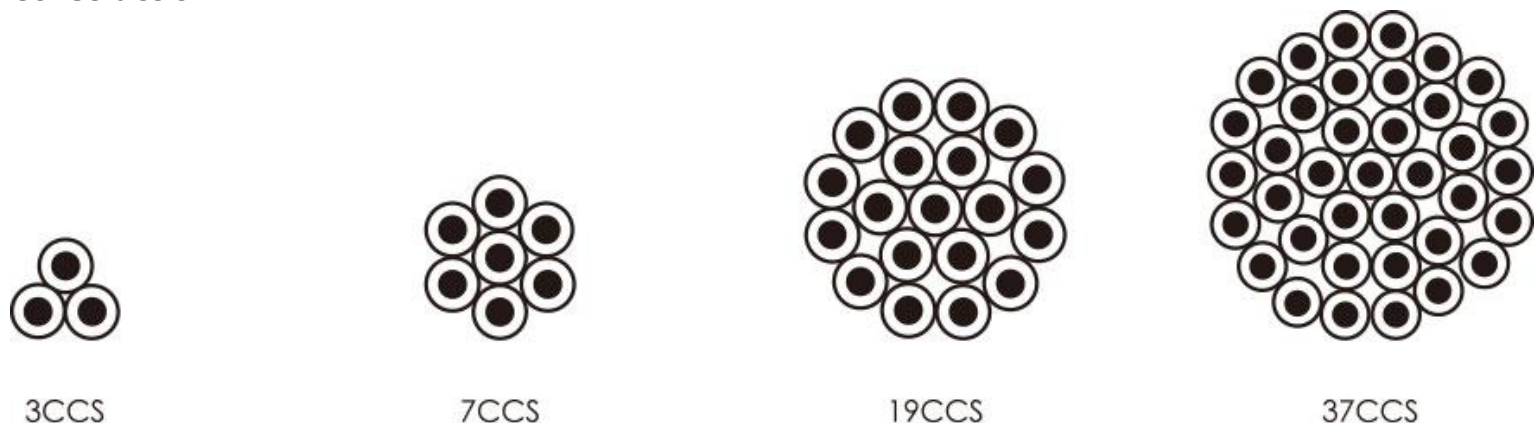
Application

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Standard

Basic design to ASTM-B227 B228 standard

Construction



Construction Parameters

Model	Nominal area	Wire quantity	Outer diameter		Weight/km		Pulling strength				20°C resistance	Max
	mm ²		Monofilament	Conductor	Grade 30	Grade 40	Grade 40 LC	Grade 30 LC	Grade 40 HS	Grade 30 HS	Grade 40	Grade 30
			mm	mm	Kg/km		kgf				Ω/km	
19 No.5	318.7	19	4.62	23.11	2634	2660.8	7823	8800	8800	9778	0.1442	0.1923
19 No.6	252.7	19	4.11	20.57	2087.8	2110.2	6205	6980	6980	7756	0.1818	0.2424
19 No.7	200.45	19	3.66	18.31	1656.3	1674.1	4923	5538	5538	6154	0.2294	0.3058
19 No. 8	158.96	19	3.26	16.31	1313.6	1327.4	3904	4392	4392	4880	0.289	0.3852
19 No. 9	126.06	19	2.91	14.53	1041.7	1052.5	3094	3481	3481	3868	0.3645	0.4862
7 No. 4	148.06	7	5.19	15.57	1218.6	1231.4	3636	4090	4090	4544	0.3093	0.4124
7 No. 5	117.41	7	4.62	13.87	966.4	976.5	2882	3242	3242	3603	0.3898	0.5197
7 No. 6	93.09	7	4.11	12.34	766.2	774.2	2286	2572	2572	2857	0.4915	0.6552
7 No.7	73.87	7	3.67	11	608	614.4	1814	2040	2040	2267	0.6201	0.8268
7 No. 8	58.56	7	3.26	9.78	482	487	1438	1618	1618	1798	0.7812	1.0414
7 No. 9	46.43	7	2.9	8.71	382.1	386.1	1140	1282	1282	1425	0.9859	1.3144
7 No. 10	36.82	7	2.59	7.77	303.1	306.2	904	1017	1017	1131	1.2422	1.6559
3 No. 5	50.32	3	4.62	9.96	413.4	417.7	1304	1467	1467	1630	0.9082	1.2104
3 No. 6	39.9	3	4.11	8.86	327.8	331.2	1034	1163	1163	1293	1.1447	1.526
3 No. 7	31.64	3	3.66	7.9	259.9	262.6	820	923	923	1026	1.444	1.925
3 NO. 8	25.09	3	3.26	7.04	206.1	208.3	651	732	732	813	1.8193	2.4253
3 No. 9	19.9	3	2.91	6.27	163.5	165.1	516	580	580	645	2.2957	3.0605

3 No. 10	15.78	3	2.59	5.59	129.6	130.9	409	460	460	511	2.8929	3.8552
3 No. 12	9.92	3	2.05	4.42	81.5	82.4	260	292	292	325	4.5573	6.0731

CCS – Copper Clad Steel Wire IEC

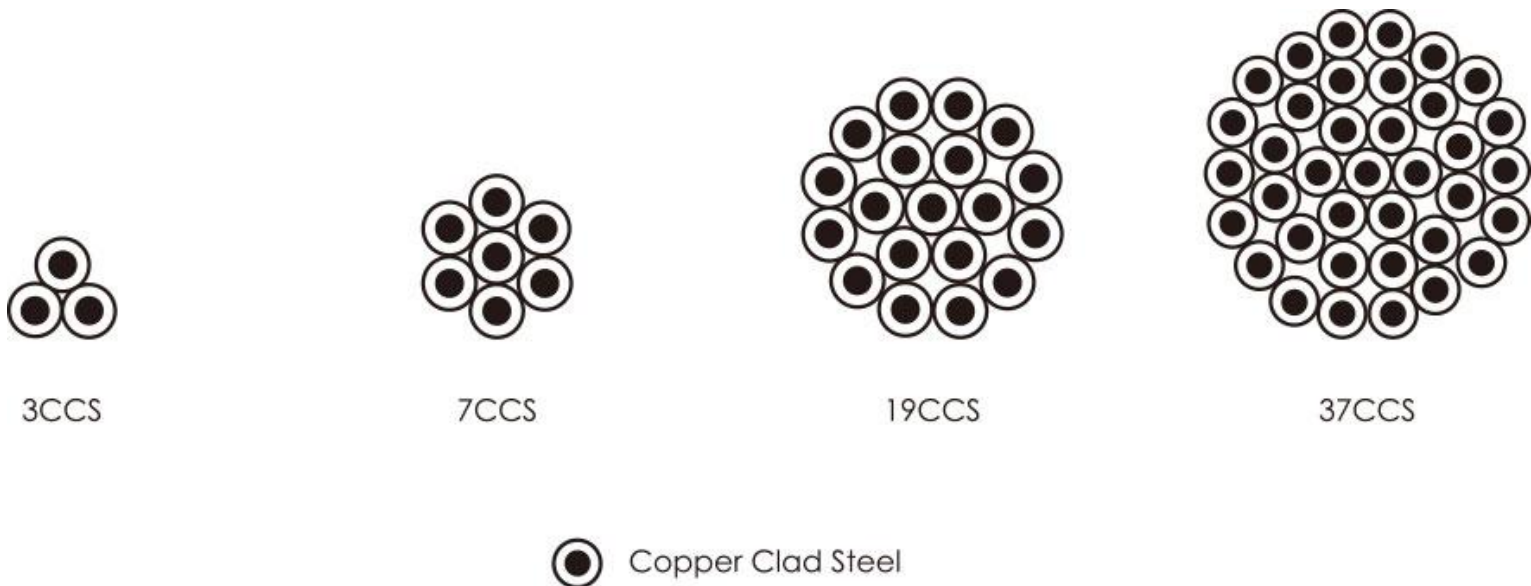
Application

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Standard

Basic design to IEC standard

Construction



Construction Parameters

Size	Strands*single path	Diameter	Conductivity
mm ²		mm	%
10	7*1.4	4.2	18%—70%
16	7*1.7	5.1	18%—70%
25	7*2.14	6.42	18%—70%
35	7*2.52	7.356	
50	7*3.00	9	18%—70%
70	19*1.44	10.7	18%—70%

95	19*2.52	12.6	18%—70%
120	19*2.80	14	18%—70%
150	19*3.15	15.75	18%—70%
185	37*2.52	17.64	18%—70%
240	37*2.85	19.95	18%—70%
300	37*3.15	21.7	18%—70%

Nominal Sectional Area mm ²	structure Stock/diameter mm	Area mm ²	Breaking load kg			D.C. Resistance Ω/km		Line quality Kg/km	
			40HS	30HS	30EHS	40%	30%	30%	40%
320	19/4.62	318.71	22788	25206	30350	0.1399	0.1865	2634.0	2660.8
250	19/4.12	252.71	18849	20788	25188	0.1764	0.2352	2087.9	2110.2
200	19/3.67	200.45	15599	17118	20797	0.2225	0.2966	1656.3	1674.2
160	19/3.26	158.97	12873	14079	17096	0.2805	0.3740	1313.6	1327.2
120	19/2.91	126.06	10609	11567	13884	0.3537	0.4715	1041.7	1052.6
150	7/5.19	148.06	10120	11240	13349	0.3000	0.4000	1218.7	1231.5
120	7/4.62	117.42	8396	9285	11181	0.3783	0.5043	966.41	976.53
90	7/4.12	93.097	6954	7661	9280	0.4771	0.6359	766.25	774.29
70	7/3.67	73.871	5747	6309	7661	0.6014	0.8019	608.06	614.46
60	7/3.26	58.561	4745	5189	6300	0.7586	1.0109	482.02	487.07
50	7/2.91	46.439	3908	4261	5116	0.9564	1.2750	382.16	386.18
35	7/2.59	36.826	3230	3519	4171	1.2061	1.6077	303.14	306.26
50	3/4.62	50.322	3798	4201	5380	0.8809	1.1743	413.41	417.73
40	3/4.12	39.903	3145	3465	4424	1.1106	1.4807	327.84	331.26

30	3/3.67	31.645	2600	2854	3593	1.4007	1.8672	259.98	262.66
25	3/3.26	25.097	2145	2347	2849	1.7662	2.3544	206.11	208.34
20	3/2.91	19.903	1768	1928	2326	2.2271	2.9690	163.55	165.19
15	3/2.59	15.781	1461	1592	1887	2.8082	3.7436	129.62	130.99
10	3/2.05	9.929	1014			4.4654		81.55	82.414