

Conductors

Types and sizes

Comparison

Size		Stranding # x mm	Diameter			DC Resistance			Weight Nom g/m
AWG	CSA mm ²		Min Ø	Nom Ø	Max Ø	Ω/km at 20°C (Habia k-std: 01-01-004) Max			
	TPC	CU / SPC				NPC			
-	400	2,013 x 0.500	28.0	30.0	31.0	0.0495	0.0486	0.495	3,588
-	300	1,525 x 0.500	24.0	26.0	27.0	0.0654	0.0641	0.654	2,718
-	240	1,221 x 0.500	22.0	23.0	24.0	0.0817	0.0801	0.0817	2,176
-	185	925 x 0.500	19.0	20.0	21.0	0.108	0.106	0.108	1,649
-	150	777 x 0.500	17.0	18.0	19.0	0.132	0.129	0.132	1,385
-	120	629 x 0.500	15.0	16.0	17.0	0.164	0.161	0.164	1,121
0000	107	2,109 x 0.254	-	15.2	16.1	0.184	0.177	0.184	1,018
-	95.0	475 x 0.500	13.5	14.3	15.1	0.210	0.206	0.210	847
000	81.0	1,675 x 0.254	13.4	13.7	14.0	0.233	0.223	0.233	760
-	70.0	361 x 0.500	11.7	12.4	13.1	0.277	0.272	0.277	643
00	68.0	1,330 x 0.254	11.18	11.8	12.07	0.299	0.279	0.292	654
0	53.0	1,045 x 0.254	10.03	10.5	10.8	0.381	0.354	0.371	504
-	50.0	399 x 0.400	9.60	10.3	11.0	0.393	0.386	0.393	455
1	41.4	817 x 0.254	9.00	9.40	9.70	0.489	0.456	0.472	386
-	35.0	278 x 0.400	7.80	8.40	9.20	0.565	0.554	0.565	319
2	34.0	665 x 0.254	8.13	8.40	8.64	0.600	0.558	0.581	318
-	25.0	196 x 0.400	6.60	7.20	7.80	0.795	0.780	0.795	224
4	21.6	133 x 0.454	6.35	6.60	6.80	0.919	0.866	0.902	192
-	16.0	126 x 0.400	5.30	5.70	6.10	1.24	1.21	1.24	144
6	13.6	133 x 0.361	5.03	5.27	5.38	1.46	1.37	1.43	128
-	10.0	80 x 0.400	3.85	3.93	4.07	1.95	1.91	1.95	91.0
8	8.60	133 x 0.287	4.00	4.15	4.30	2.29	2.15	2.27	77.7
-	6.00	84 x 0.300	2.84	2.92	3.04	3.39	3.30	3.39	53.0
10	4.74	37 x 0.404	2.69	2.74	2.84	4.13	3.90	4.06	43.5
-	4.00	56 x 0.300	2.39	2.48	2.53	5.09	4.95	5.09	36.0
12	3.09	19 x 0.455	2.083	2.15	2.184	6.29	5.93	6.20	27.67
	3.00	37 x 0.320	2.02	2.10	2.180	6.62	6.23	6.49	23.30
-	2.50	50 x 0.250	1.87	1.95	2.010	8.21	7.98	8.21	21.90
14	1.94	19 x 0.361	1.651	1.706	1.753	10.0	9.44	9.84	17.41
-	1.50	30 x 0.250	1.43	1.50	1.570	13.7	13.3	13.7	13.60
16	1.23	19 x 0.287	1.321	1.358	1.397	15.7	14.8	15.6	11.00
	1.30	1 x 1.290	1.278	1.29	1.328	14.3	13.7	14.2	11.63
-	1.00	32 x 0.200	1.15	1.20	1.290	20.0	19.5	20.0	9.000
18	0.963	19 x 0.254	1.169	1.201	1.245	20.4	19.0	20.0	8.634
	0.897	7 x 0.404	1.194	1.212	1.270	21.9	20.6	21.3	8.049
	0.823	1 x 1.024	1.013	1.024	1.054	22.6	21.6	21.9	7.330
-	0.75	24 x 0.200	1.03	1.050	1.080	26.7	26.0	26.0	6.800
		19 x 0.226	1.03	1.080	1.150	26.7	-	-	6.800
19 *	0.650	1 x 0.900	0.855	0.900	0.909	-	64.3	65.0	5.662
20	0.615	19 x 0.203	0.94	0.961	0.991	32.4	30.1	32.0	5.512
	0.563	7 x 0.320	0.915	0.960	0.991	35.7	32.8	35.1	5.046
	0.519	1 x 0.813	0.805	0.813	0.838	35.7	34.4	35.1	4.620

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Conductors

Types and sizes

Comparison (continued)

Size		Stranding # x mm	Diameter			DC Resistance			Weight Nom g/m
AWG	CSA mm ²		Min Ø	Nom Ø	Max Ø	Ω/km at 20°C (Habia k-std: 01-01-004) Max			
	TPC	CU / SPC				NPC			
-	0.500	19 x 0.185	0.860	0.880	0.900	40.1	39.00	40.10	4.300
	0.500	16 x 0.203	0.820	0.880	0.920	38.0	-	38.0	4.500
22	0.382	19 x 0.160	0.737	0.757	0.787	53.1	49.5	52.5	3.433
	0.354	7 x 0.254	0.712	0.762	0.788	56.1	52.1	54.4	3.188
	0.324	1 x 0.643	0.635	0.643	0.663	58.0	55.7	59.3	2.890
23 *	0.283	1 x 0.600	0.570	0.600	0.606	-	64.3	65.0	2.516
24	0.241	19 x 0.127	0.584	0.600	0.610	85.9	79.7	85.0	2.159
	0.220	7 x 0.203	0.585	0.609	0.635	88.5	82.6	86.9	2.033
	0.205	1 x 0.511	0.515	0.511	0.526	91.2	87.9	89.8	1.825
26	0.155	19 x 0.102	0.457	0.480	0.508	135	126	138	1.392
	0.140	7 x 0.160	0.458	0.480	0.508	142	132	141	1.263
	0.128	1 x 0.404	0.399	0.404	0.417	148	140	143	1.141
28	0.095	19 x 0.079	0.355	0.372	0.381	222	207	222	0.835
	0.089	7 x 0.127	0.356	0.381	0.406	225	209	222	0.793
	0.080	1 x 0.320	0.318	0.320	0.330	234	223	229	0.716
30	0.061	19 x 0.060	0.296	0.300	0.304	358	321	-	0.543
	0.057	7 x 0.102	0.280	0.306	0.330	355	330	363	0.511
	0.050	1 x 0.254	0.251	0.254	0.262	381	354	367	0.451
32	0.037	19 x 0.052	0.248	0.254	0.257	-	490	-	0.329
	0.035	7 x 0.079	0.224	0.237	0.279	620	567	606	0.307
	0.032	1 x 0.203	0.201	0.203	0.211	584	554	574	0.288
34	0.023	7 x 0.060	-	0.180	-	871	-	-	0.204
	0.020	1 x 0.160	0.157	0.160	0.168	950	-	-	0.179
36	0.014	7 x 0.050	-	0.150	-	1,160	-	-	0.124
	0.013	1 x 0.127	0.124	0.127	0.135	1,521	-	-	0.113
38	0.008	1 x 0.102	0.101	0.102	0.105	-	2,237	-	0.071
40 **	0.005	1 x 0.079	0.077	0.079	0.082	-	4,410	-	0.044
42 **	0.003	1 x 0.064	0.061	0.064	0.067	-	-	5,700	0.026
44 **	0.002	1 x 0.051	0.048	0.051	0.053	-	11,100	-	0.017

Materials

As standard, Habia Cable manufactures in Tin Plated Copper (TPC) for temperatures up to 150°C, Silver Plated Copper (SPC) for <200°C and Nickel Plated Copper (NPC) for <250°C. Not all sizes are applicable to all platings. For more specialist applications, Habia Cable also offers plain Copper (Cu), which is usually chosen for very highly stranded conductors, and Silver Plated High Strength Copper Alloy (HSA) which offers approximately 10x the strength and flex-life of the equivalent standard copper conductor stranding. These are usually used for very small wires.

Specifications

Conductor resistances specified above are in accordance with Habia document: K Std: 01-01-004 where metric sizes 400mm² to 0.5mm² are supplied in accordance with IEC 60228 Class 5 and Class 6 and AWG sizes 32 AWG to 0000 AWG are in accordance with MIL-DTL-16878 and MIL-DTL-22759. In addition, we use some common strandings included from BS 3G 210 (indicated by *) and smaller sizes, which are offered in either silver or nickel plated, high strength copper alloy to ASTM B624 (indicated by **).

Twisting cores

The process of twisting cores together into a cable also increases the conductor resistance as the cores have to travel around one another as well as from point to point. Twisted cables have resistance values around 5% higher than a straight, insulated conductor.

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