Product Overview

Bare Copper Conductor is an uninsulated electrical conductor manufactured from high-conductivity copper. It is widely used in power transmission, electrical grounding, earthing systems, and various industrial electrical applications.

Available in solid or stranded configurations, bare copper conductors offer excellent electrical conductivity, good mechanical properties, and reliable performance. Stranded constructions provide flexibility and facilitate installation in different electrical systems.

Depending on project requirements, bare copper conductors can be supplied in soft-drawn, medium-hard-drawn, or hard-drawn conditions, with customized conductor sizes and stranding configurations.

Stranded Bare and Tinned Copper Conductors are manufactured from high-conductivity copper wires and designed for electrical applications requiring reliable conductivity, flexibility, and mechanical performance.

Available in both bare copper and tin-coated copper constructions, these conductors are suitable for electrical grounding, overhead power transmission and distribution systems, and various industrial electrical applications.

Bare copper conductors are available in soft, medium-hard, and hard tempers, while tinned copper stranded conductors are supplied in soft temper. The tin coating provides additional protection against corrosion and helps improve the conductor's suitability for certain operating environments.

Construction

Bare copper conductors are manufactured using high-conductivity copper wires and can be supplied in different constructions:

- **Solid Conductor:** A single copper wire for applications requiring a simple and compact conductor structure.
- **Stranded Conductor:** Multiple copper wires concentrically stranded together to provide improved flexibility and mechanical handling.
- **Soft-Drawn Copper:** Suitable for applications requiring greater flexibility and ease of installation.
- **Hard-Drawn Copper:** Provides higher mechanical strength for applications requiring improved tensile performance.

Stranded Tinned Copper Conductors

- Manufactured from soft-drawn copper wires.
- Concentric-lay stranded construction.
- Copper wires are coated with tin through hot-dipping or electroplating.
- Tin coating improves corrosion resistance and provides additional surface protection.

Conductor diameter, wire count, stranding arrangement, and temper can be customized according to applicable standards and project specifications.

Applications

Bare copper conductors are widely used in:

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- Electrical grounding and earthing systems
- Power distribution and transmission installations
- Substation grounding networks
- Lightning protection systems
- Electrical equipment grounding
- Industrial electrical installations
- Railway and infrastructure grounding applications
- Copper conductor connections and electrical assemblies

Key Features & Benefits

- **High Electrical Conductivity:** Provides efficient electrical current transmission.
- **Good Corrosion Resistance:** Copper offers reliable performance in many operating environments.
- **Mechanical Strength:** Available in different temper conditions to meet mechanical requirements.
- **Flexible Construction Options:** Solid and stranded configurations are available.
- **Reliable Grounding Performance:** Suitable for grounding, earthing, and lightning protection systems.
- **Customized Specifications:** Available in different diameters, cross-sectional areas, and stranding arrangements.

Applicable Standards

Depending on conductor construction and application, bare copper conductors can be manufactured in accordance with relevant standards, including:

- **ASTM B1:** Hard-Drawn Copper Wire
- **ASTM B2:** Medium-Hard-Drawn Copper Wire
- **ASTM B3:** Soft or Annealed Copper Wire
- **ASTM B8:** Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
- ASTM B-33 Tinned soft or annealed copper wire
- ASTM B-258
- Federal Sepc QQ-W-343

The applicable standard should be selected according to the required conductor type, temper, and project specifications.

Technical Specifications

ASTM B

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Size	No. of Strands	Hard-Drawn		Medium-Hard Drawn		Soft-Drawn		Overall Diameter	Net Weight	Allowable Ampacity *
		Rated Strength	DC Resistance @ 20°C	Rated Strength	DC Resistance @ 20°C	Rated Strength	DC Resistance @ 20°C			
AWG/kcmil		lbs.	Ohms/1000'	lbs.	Ohms/1000'	lbs.	Ohms/1000'	inches	lbs/kft	
10	7	492	1.06000	389	1.05400	314	1.01900	0.130	32.06	50
8	7	777	0.66630	610	0.66290	499	0.64080	0.146	51.0	95
6	7	1,228	0.41910	959	0.41690	794	0.40300	0.184	81.1	130
4	7	1,938	0.26360	1,505	0.26220	1,320	0.25340	0.232	128.9	170
3	7	2,433	0.20900	1,885	0.20790	1,670	0.20100	0.260	162.5	200
2	7	3,050	0.16600	2,360	0.16500	2,110	0.15780	0.292	204.9	230
1	7	3,801	0.13160	2,955	0.13090	2,552	0.12520	0.328	258.4	265
1/0	7	4,752	0.10420	3,705	0.10370	3,221	0.10020	0.368	325.8	310
1/0	19	4,752	0.10420	3,705	0.10370	3,221	0.10020	0.373	325.8	310
2/0	7	5,926	0.08267	4,640	0.08224	4,062	0.07949	0.414	410.9	355
2/0	19	6,690	0.08267	4,765	0.08224	4,024	0.07949	0.418	410.9	355
3/0	7	7,366	0.06556	5,812	0.06522	5,118	0.06304	0.464	518.1	410
3/0	19	7,698	0.06556	5,970	0.06522	5,074	0.06304	0.470	518.1	410
4/0	7	9,154	0.05199	7,278	0.05172	6,459	0.04999	0.522	653.3	480
4/0	19	9,617	0.05199	7,479	0.05172	6,453	0.04999	0.528	653.3	480
250	19	11,360	0.04400	8,836	0.04378	7,627	0.04231	0.574	771.9	530
250	37	11,600	0.04400	8,952	0.04378	7,940	0.04231	0.575	771.9	530
300	19	13,510	0.03667	10,530	0.03648	9,160	0.03526	0.628	926.3	590
300	37	—	—	—	—	—	—	0.630	926.3	—
350	19	15,590	0.03143	12,200	0.03127	10,680	0.03022	0.679	1,081	650
350	37	16,060	0.03143	12,450	0.03127	10,580	0.03022	0.681	1,081	650

BS 7884

Nominal Cross Section Area	No./Nominal Dia. of Wire	Approx. Overall Dia.	Approx. weight	Nominal DC Resistance at 20°C		Nominal Breaking Load
				Nominal	Max.	
mm2	No./mm	mm	kg/km	Ω/km	Ω/km	N
10	7/1.35	4.05	89.82	1.7880	1.8290	3752
14	7/1.60	4.80	126.2	1.2730	1.3030	5267
16	3/2.65	5.70	148.3	1.0820	1.1060	6194
16	7/1.70	5.10	142.4	1.1280	1.1540	5946
25	7/2.10	6.30	2173	0.7391	0.7563	9073

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				Nominal	Max.	
mm2	No./mm	mm	kg/km	Ω/km	Ω/km	N
32	3/3.75	8.06	296.9	0.5405	0.5520	12400
32	7/2.46	7.38	298.2	0.5386	0.5497	12442
35	7/2.50	7.50	308.0	0.5215	0.5337	12860
50	7/3.00	9.00	443.5	0.3622	0.3706	18520
50	19/1.80	9.00	435.8	0.3727	0.3819	17700
70	7/3.55	10.65	621.1	0.2586	0.2646	25930
70	19/2.10	10.50	593.2	0.2738	0.2806	24090
95	19/2.50	12.50	840.7	0.1932	0.1980	34140
100	7/4.30	12.90	911.2	0.1763	0.1810	36540
120	19/2.80	14.00	1055	0.1540	0.1578	42830
125	19/2.90	14.50	1131	0.1436	0.1471	45940
150	19/3.20	16.00	1377	0.1180	0.1208	55940
150	37/2.25	15.75	1334	0.1233	0.1264	53880
185	19/3.55	17.75	1695	0.09582	0.09815	68860
185	37/2.50	17.50	1647	0.09981	0.1024	66490

ASTM--SOLID

Size	Nominal Cross Section Area		Approx. Overall Dia.	Approx. Weight	Nominal DC Resistance at 20°C	Nominal Breaking Load
AWG	Cmils	mm2	mm	kg/km	Ω/km	kN
1	83690	42.4	7.35	377.0	0.423	16.3
2	66360	33.6	6.54	299.0	0.533	13.3
4	41740	21.2	5.19	188.0	0.848	8.8
6	26240	13.3	4.12	118.0	1.349	5.7
8	16510	8.4	3.26	74.0	2.143	3.7
10	10380	5.3	2.59	47.0	3.409	2.3
12	6530	3.3	2.05	29.0	5.419	1.5
14	4110	2.1	1.63	19.0	8.610	0.9
16	2580	1.3	1.29	12.0	13.715	0.6
18	1620	0.8	1.02	7.0	21.843	0.4

ASTM- CLASS"A"

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Size	Nominal Cross Section Area		No./Nominal Dia. of Wire	Approx. Overall Dia.	Approx. Weight	Nominal Breaking Load	Nominal DC Resistance at 20°C
AWG	Cmils	mm2	No./mm	mm	kg/km	kN	Ω/km
4	41740	21.1	7/1.96	5.88	192.0	9.6	0.8650
2	66360	33.6	7/2.47	7.42	305.0	14.9	0.5440
1/0	105600	53.5	7/3.12	9.36	485.0	23.5	0.3420
2/0	133100	67.4	7/3.50	10.50	611.0	29.3	0.2710
4/0	211600	107.2	7/4.42	13.20	972.0	45.0	0.1710
250	250000	126.7	19/2.91	14.60	1149.0	56.4	0.1440
300	300000	152.0	19/3.19	16.00	1379.0	66.9	0.1200
350	350000	177.3	19/3.45	17.20	1609.0	77.1	0.1030
400	400000	202.7	19/3.69	18.40	1838.0	87.0	0.0900
500	500000	253.4	37/2.95	20.70	2298.0	111.5	0.0720
600	600000	304.0	37/3.23	22.60	2758.0	133.8	0.0600
700	700000	354.7	61/2.72	24.50	3216.0	157.8	0.0520
750	750000	380.0	61/2.82	25.30	3447.0	169.1	0.0480
800	800000	405.4	61/2.91	26.20	3676.0	178.4	0.0450
900	900000	456.0	61/3.09	27.80	4136.0	200.6	0.0400
1000	1000000	506.7	61/3.25	29.30	4596.0	223.0	0.0360

ASTM- CLASS"B"

Size	Nominal Cross Section Area		No./Nominal Dia. of Wire	Approximate Overal Dia.	Approx. Weight	Nominal Breaking Load	Nominal DC Resistance at 20°C
AWG	Cmils	mm2	No./mm	mm	Kg/km	kN	Ω/km
6	26240	13.3	7/1.56	4.67	121.0	6.0	1.3800
4	41740	21.1	7/1.96	5.88	192.0	9.6	0.8650
2	66360	33.6	7/2.47	7.42	305.0	14.9	0.5440
1/0	105600	53.5	19/1.89	9.47	485.0	24.3	0.3420
2/0	133100	67.4	19/2.13	10.60	611.0	30.3	0.2710
4/0	211600	107.2	19/2.68	13.40	972.0	47.7	0.1710
250	250000	126.7	37/2.09	14.60	1149.0	57.0	0.1440
300	300000	152.0	37/2.29	16.00	1379.0	68.4	0.1200
350	350000	177.3	37/2.47	17.30	1609.0	78.9	0.1030
400	400000	202.7	37/2.64	18.50	1838.0	90.2	0.0900
500	500000	253.4	37/2.95	20.70	2298.0	111.5	0.0720
600	600000	304.0	61/2.52	22.70	2758.0	135.3	0.0600
700	700000	354.7	61/2.72	24.50	3216.0	157.8	0.0520

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AWG	Cmils	mm2	No./mm	mm	Kg/km	kN	Ω/km
750	750000	380.0	61/2.82	25.30	3447.0	169.1	0.0480
800	800000	405.4	61/2.91	26.20	3676.0	178.4	0.0450
900	900000	456.0	61/3.09	27.80	4136.0	200.6	0.0400
1000	1000000	506.7	61/3.25	29.30	4596.0	223.0	0.0360

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