

MVCC CONDUCTOR

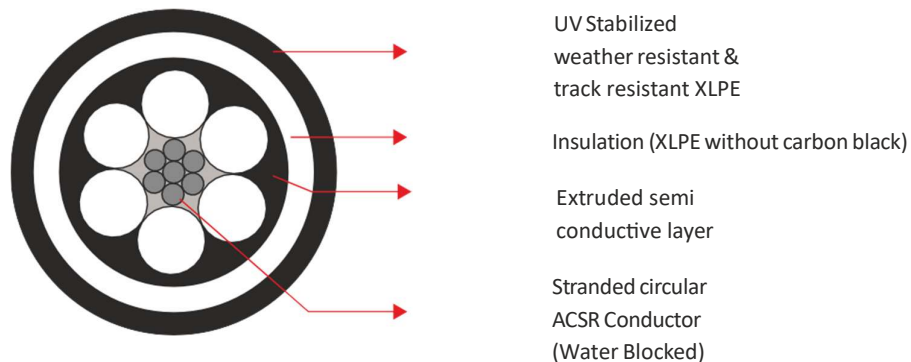
Medium voltage covered conductor (MVCC) typically denotes a type of electrical conductor designed for medium voltage applications, typically ranging between 11 kV and 33 kV. These conductors are insulated and covered to ensure safe and efficient power distribution

To enhance performance and safety, a covered conductor, such as those designated as medium voltage covered conductors (MVCC), commonly features insulation or a protective covering made of cross-linked polyethylene (XLPE). This insulation or covering serves the critical purpose of shielding the conductor, thereby reducing the risk of electrical malfunctions and preventing accidental contact with external elements

In overhead power distribution systems, covered conductors play a crucial role, particularly in various environmental conditions. The insulation of the conductor acts as a protective barrier, shielding it from elements such as sunlight, moisture, and other potential sources of damage.

Applicable Standards

These Cables are generally offered as per IEC: 61089, IS: 398 -2, IEC: 61089, BS EN: 50182/50397.



Construction OF MVCC

- Conductor – Longitudinally watertight stranded all aluminium alloy (AAAC), AL-7, AL-59, or AL-59 Aluminium Clad Steel (ACS) and ACSR
- Shielding – Semi Conducting Cross-Linked Polymer.
- Inner Covering – Low-Density track resistance cross-linked Polyethylene (Without Carbon Black)
- Outer Covering – High-density UV & track resistance Cross-linked Polyethylene

Application OF MVCC

Medium voltage-covered conductors are used in a variety of electrical power distribution system scenarios. The following are a few typical uses

- **Overhead Power Distribution Lines**

Medium-voltage electricity is delivered from substations to residential, commercial, and industrial areas via overhead power distribution lines, which frequently use covered conductors.

By shielding the conductors from the elements, the insulation lowers the possibility of electrical failures brought on by exposure to pollutants, moisture, or other impurities

- **Urban and Suburban Areas**

Covered conductors can be used to increase the visual impact of power lines and reduce the possibility of unintentional contact with live parts in urban and suburban settings where aesthetics and safety are valued.

- **High Environmental Stress Areas**

Over an extended period, bare conductor performance may deteriorate in environments with elevated pollution, moisture, or corrosive elements. The power distribution system's longevity is increased by covered conductors, which offer an extra degree of defense against these types of environmental stresses.

- **Areas with Vegetation**

In places with a lot of vegetation, where there is a greater chance of branches or trees coming into contact with power lines, covered conductors are appropriate. The insulation lessens the possibility of faults and outages caused by vegetation

- **Coastal and Harsh Environments**

Covered conductors offer an extra layer of defense against corrosion and environmental damage in coastal areas and other harsh environmental regions where exposure to salt, humidity, and extreme weather is a concern.

- **High-Altitude Installations**

Given their greater exposure to inclement weather, covered conductors may be recommended in mountainous or high-altitude areas. The insulation aids in shielding the conductors from environmental hazards like snow and ice.

- **Industrial Facilities**

Industrial facilities may use medium voltage-covered conductors to distribute power from the main substation to different areas of the building. Harsh operating conditions and the presence of industrial chemicals are two things that the insulation helps shield against

- **Renewable Energy Projects**

Covered conductors can be used for medium voltage interconnection within the power generation facility and for connecting the facility to the larger electrical grid in renewable energy projects, such as solar or wind farms.

- **Railway Electrification**

In electrified railway systems, where trains are powered by medium voltage, covered conductors may be used. Insulation improves safety by reducing electrical interference.

Advantages of MVCC

Enhanced Safety

The insulation layer surrounding the MVCC conductor improves safety by reducing the risk of accidental contact with the conductor. This is especially important in areas with high human activity or harsh environmental conditions where exposure to live wires could cause serious accidents.

Reduced Electrical Losses

MVCC conductors have a higher conductivity and reduced electrical losses compared to traditional insulated conductors, as they are designed to minimize energy dissipation over long distances, which is beneficial in high-voltage power systems.

Increased Durability

The insulation on MVCC conductors provides extra protection against mechanical damage, corrosion, and harsh environmental factors like rain, UV radiation, and temperature fluctuations. This makes them more durable and reliable over time, extending their operational life.

Compact Design

MVCC conductors have a smaller overall cross-section than many traditional conductors, making them suitable for high-density installations. They are especially useful in urban areas where space for overhead power lines is limited, allowing for more compact, efficient installations.

Reduced Electromagnetic Interference (EMI)

The insulation layer helps in reducing electromagnetic interference, which is especially critical in sensitive areas like telecommunication lines, hospitals, and high-tech industries, where minimal interference is required to ensure optimal performance.

Corrosion Resistance

The metallic conductor, often made of Aluminum or copper, along with its protective insulation, resists corrosion better than traditional conductors, especially in environments with high moisture or salt content (e.g., coastal areas).

Environmentally Friendly

The use of non-toxic and recyclable insulation materials in MVCC conductors ensures they

Faster Installation

The integrated insulation eliminates the need for additional protective coatings or separate insulation layers, which can reduce installation time and labor costs, making MVCC conductors more cost-effective for installation in both rural and urban areas.

Minimal Maintenance

Due to their protective insulation and resistance to environmental stressors, MVCC conductors generally require less maintenance than traditional power cables, which results in long-term cost savings and improved operational efficiency.

Reduced Risk of Short Circuits

The insulation also prevents short circuits by preventing contact between conductors in the case of mechanical wear or damage, further enhancing the reliability and safety of the system.

Description		Construction		Type		
50		7Strands		AAAC / AL-7 / AL -59		
55		7 Strands		AAAC / AL-7 / AL -59		
70		7 Strands		AAAC / AL-7 / AL -59		
80		7 Strands		AAAC / AL-7 / AL -59		
90		7 Strands		AAAC / AL-7 / AL -59		
100		7 Strands		AAAC / AL-7 / AL -59		
120		19 Strands		AAAC / AL-7 / AL -59		
125		19 Strands		AAAC / AL-7 / AL -59		
148		19 Strands		AAAC / AL-7 / AL -59		
159		19 Strands		AAAC / AL-7 / AL -59		
160		19 Strands		AAAC / AL-7 / AL -59		
232		19 Strands		AAAC / AL-7 / AL -59		
241		19 Strands		AAAC / AL-7 / AL -59		
Description		Construction		Type		
		ACS	AL-59			
31.6		1 Strands	6 Strands	AL-59 ACS		
52.88		1 Strands	6 Strands	AL-59 ACS		
78.82		1 Strands	6 Strands	AL-59 ACS		
104.98		1 Strands	6 Strands	AL-59 ACS		
120		7 Strands	26 Strands	AL-59 ACS		
160		7 Strands	30 Strands	AL-59 ACS		
241		7 Strands	30 Strands	AL-59 ACS		
Sr. No.	Cable Attributes	UOM		Nominal Thickness		
				11 KV	22 KV	33 KV
1	Aluminium Alloy Wire	Sq.mm			As Per Requirement	
2	Extruded Longitudinal Water Blocking Layer	mm		As Required to make Water Blocked arrangements		
3	Extruded Semi Conductive Layer	mm		0.3	0.3	0.4
4	Inner Insulation of XLPE Without Carbon Black	mm		1.2	1.32	2.43
5	Outer Insulation with UV & Track Resistant XLPE	mm		1.1	1.1	1.2

MV Tree Wire

5 kV - 35 kV

Features

Outer layer is sun resistant and withstands UV degradation.

Cross-linked or thermosetting covering system is designed to have a normal operation temperature up to 90 Deg C.

High Density outer covering resists abrasion when in contact with tree or other vegetation.

Outer XL-HDPE covering meets the track resistance qualification per ASTM D2303 with min test voltage of 2.5 kV and min time to track of 1000 minutes.

The outer track-resistant conductor covering prevents direct shorts and instantaneous flashovers due to conductor contact with tree limbs and other objects. This feature results in fewer power outages and reduces the need for frequent tree trimming.

Cable outer covering is offered in both gray and black colors.

Application

For distribution overhead power lines where space for right-of-way is limited or in close proximity to trees and other vegetation, installed in similar manner as bare conductors without any conductor voltage rating and require the use of compatible insulators and supported on crossarms or brackets.

Standards

ICEA S-121-733

Tree Wire and Messenger Supported Spacer Cable

Specifications

Maximum operating voltage:

- 5 kV to 35 kV

Maximum conductor operation temperatures:

THERMOSETTING SYSTEM

- Normal: 90 °C
- Emergency: 130 °C
- Short Circuit: 250 °C

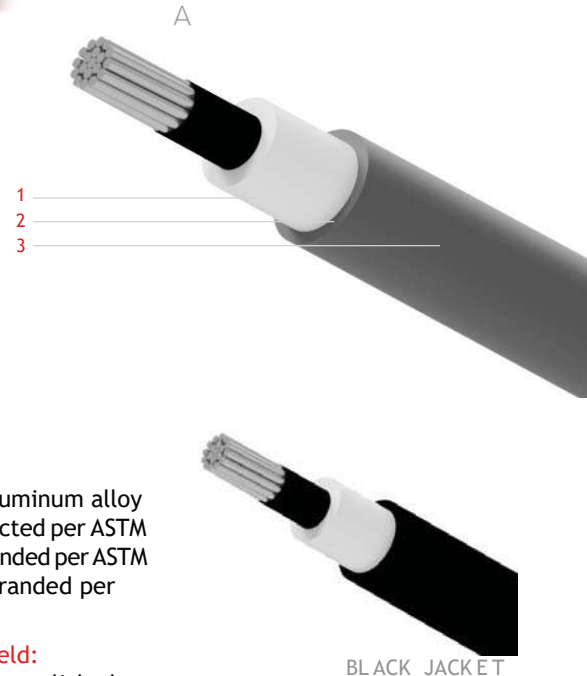
Engineering Information

1. Conductor: Aluminum alloy 1350-H19 compacted per ASTM B400 or ACSR stranded per ASTM B232 or AAAC stranded per ASTM B399.

2. Conductor Shield: Semiconducting cross-linked polyethylene (XLPE).

3. Inner Layer: Natural low density cross-linked polyethylene (XL-LDPE).

4. Outer Layer: Gray or black sun resistant and track-resistant cross-linked high density polyethylene (XL-HDPE).



Technical Data

AAC Conductor 15 kV System

Size AWG	Number of Strands	Conductor Diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in	mils	mils	mils	in	lb/kft	lbs
1/0	7	0.336	15	75	75	694	222	1791
2/0	7	0.376	15	75	75	734	258	2259
3/0	7	0.423	15	75	75	781	303	2736
4/0	7	0.475	15	75	75	833	359	3447
266.8	19	0.537	15	75	75	905	429	4473
336.4	19	0.603	15	75	75	971	513	5535
397.5	19	0.659	15	75	75	1027	586	6399
477	19	0.722	15	75	75	1090	679	7524
556.5	37	0.780	20	75	75	1148	759	8946
636	37	0.835	20	75	75	1213	857	10260
795	37	0.932	20	80	80	1330	1049	12510

ACSR Conductor 15 kV System

Size AWG	Number of Strands	Conductor Diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in	mils	mils	mils	in	lb/kft	lbs
4	6/1	0.250	15	75	75	608	157	1767
2	6/1	0.316	15	75	75	674	208	2708
1/0	6/1	0.398	15	75	75	756	284	4161
2/0	6/1	0.447	15	75	75	805	335	5035
3/0	6/1	0.502	15	75	75	860	399	6289
4/0	6/1	0.563	15	75	75	921	476	7933
266.8	18/1	0.609	15	75	75	977	488	6536
266.8	26/7	0.642	15	75	75	1010	575	10735
336.4	18/1	0.684	15	75	75	1052	585	8246
336.4	26/7	0.720	15	75	75	1088	693	13395
397.5	18/1	0.743	15	75	75	1111	668	9443
397.5	24/7	0.772	15	75	75	1140	757	13870
397.5	26/7	0.783	15	75	75	1151	795	15485
477	24/7	0.846	15	75	75	1214	882	16340
477	26/7	0.858	15	75	75	1226	927	18525
477	30/7	0.883	15	75	75	1251	1025	22610
556.5	18/1	0.879	20	75	75	1247	881	13015
556.5	24/7	0.914	20	75	75	1282	1004	18810
556.5	26/7	0.927	20	75	75	1295	1057	21470
636	18/1	0.940	20	75	75	1318	995	14915
636	26/7	0.990	20	75	75	1368	1196	23940

AAAC Conductor 15 kV System

Size AWG/Kcmil	Number of Strands	Conductor Diameter	Bare AAAC Codename	ACSR equivalent diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in		AWG/Kcmil	mils	mils	mils	in	lb/kft	lbs
48.69	7	0.25	ALTON	4	15	75	75	608	146	1584
77.47	7	0.316	AMES	2	15	75	75	674	190	2520
123.3	7	0.398	AZUSA	1/0	15	75	75	756	254	3843
155.4	7	0.447	ANAHEIM	2/0	15	75	75	805	298	4851
195.7	7	0.502	AMHERST	3/0	15	75	75	860	351	6111
246.9	7	0.563	ALLIANCE	4/0	15	75	75	931	423	7704
312.8	19	0.642	BUTTE	266.8	15	75	75	1010	500	9450
394.5	19	0.72	CANTON	336.4	15	75	75	1088	599	11970
465.4	19	0.783	CAIRO	397.5	15	75	75	1151	683	14040
559.5	19	0.858	DARIEN	477	20	75	75	1226	793	16920
652.4	19	0.927	ELGIN	556.5	20	75	75	1305	910	19710
740.8	37	0.99	FLINT	636	20	75	75	1368	994	21960

The above data are approximate and subject to normal manufacturing tolerances.

Technical Data

AAC Conductor 25 kV System

Size AWG	Number of Strands	Conductor Diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in	mils	mils	mils	in	lb/kft	lbs
1/0	7	0.336	15	125	125	908	327	1791
2/0	7	0.376	15	125	125	948	369	2259
3/0	7	0.423	15	125	125	995	420	2736
4/0	7	0.475	15	125	125	1047	483	3447
266.8	19	0.537	15	125	125	1119	563	4473
336.4	19	0.603	15	125	125	1185	655	5535
397.5	19	0.659	15	125	125	1241	736	6399
477	19	0.722	15	125	125	1304	837	7524
556.5	37	0.780	20	125	125	1362	925	8946
636	37	0.835	20	125	125	1427	1031	10260
795	37	0.932	20	125	125	1524	1220	12510

ACSR Conductor 25 kV System

Size AWG	Number of Strands	Conductor Diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in	mils	mils	mils	in	lb/kft	lbs
1/0	6/1	0.398	15	125	125	970	398	4161
2/0	6/1	0.447	15	125	125	1019	456	5035
3/0	6/1	0.502	15	125	125	1074	526	6289
4/0	6/1	0.563	15	125	125	1135	612	7933
266.8	18/1	0.609	15	125	125	1191	631	6536
266.8	26/7	0.642	15	125	125	1224	722	10735
336.4	18/1	0.684	15	125	125	1266	738	8246
336.4	26/7	0.720	15	125	125	1302	851	13395
397.5	18/1	0.743	15	125	125	1325	829	9443
397.5	24/7	0.772	15	125	125	1354	922	13870
397.5	26/7	0.783	15	125	125	1365	961	15485
477	24/7	0.846	15	125	125	1428	1056	16340
477	26/7	0.858	15	125	125	1440	1103	18525
477	30/7	0.883	15	125	125	1465	1204	22610
556.5	18/1	0.879	20	125	125	1461	1060	13015
556.5	24/7	0.914	20	125	125	1496	1188	18810
556.5	26/7	0.927	20	125	125	1509	1243	21470

AAAC Conductor 25 kV System

Size AWG/Kcmil	Number of Strands	Conductor Diameter	Bare AAAC Codename	ACSR equivalent diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in		AWG/Kcmil	mils	mils	mils	in	lb/kft	lbs
77.47	7	0.316	AMES	2	15	125	125	888	293	2520
123.3	7	0.398	AZUSA	1/0	15	125	125	970	368	3843
155.4	7	0.447	ANAHEIM	2/0	15	125	125	1019	418	4851
195.7	7	0.502	AMHERST	3/0	15	125	125	1074	479	6111
246.9	7	0.563	ALLIANCE	4/0	15	125	125	1145	560	7704
312.8	19	0.642	BUTTE	266.8	15	125	125	1224	648	9450
394.5	19	0.72	CANTON	336.4	15	125	125	1302	757	11970
465.4	19	0.783	CAIRO	397.5	15	125	125	1365	850	14040
559.5	19	0.858	DARIEN	477	20	125	125	1440	970	16920
652.4	19	0.927	ELGIN	556.5	20	125	125	1519	1097	19710
740.8	37	0.99	FLINT	636	20	125	125	1582	1190	21960

The above data are approximate and subject to normal manufacturing tolerances.

Technical Data

AAC Conductor 35 kV System

Size AWG	Number of Strands	Conductor Diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in	mils	mils	mils	in	lb/kft	lbs
1/0	7	0.336	15	175	125	1014	391	1791
2/0	7	0.376	15	175	125	1054	436	2259
3/0	7	0.423	15	175	125	1101	491	2736
4/0	7	0.475	15	175	125	1153	557	3447
266.8	19	0.537	15	175	125	1215	641	4473
336.4	19	0.603	15	175	125	1281	738	5535
397.5	19	0.659	15	175	125	1347	823	6399
477	19	0.722	15	175	125	1410	928	7524
556.5	37	0.780	20	175	125	1468	1020	8946
636	37	0.835	20	175	125	1523	1131	10260
795	37	0.932	20	175	125	1620	1326	12510

ACSR Conductor 35 kV System

Size AWG	Number of Strands	Conductor Diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in	mils	mils	mils	in	lb/kft	lbs
1/0	6/1	0.398	15	175	125	1076	467	4161
2/0	6/1	0.447	15	175	125	1125	528	5035
3/0	6/1	0.502	15	175	125	1180	602	6289
4/0	6/1	0.563	15	175	125	1241	692	7933
266.8	26/7	0.642	15	175	125	1320	808	10735
336.4	18/1	0.684	15	175	125	1362	827	8246
336.4	26/7	0.720	15	175	125	1398	942	13395
397.5	18/1	0.743	15	175	125	1431	922	9443
397.5	24/7	0.772	15	175	125	1450	1017	13870
397.5	26/7	0.783	15	175	125	1461	1057	15485
477	24/7	0.846	15	175	125	1534	1156	16340
477	26/7	0.858	15	175	125	1546	1204	18525
477	30/7	0.883	15	175	125	1571	1307	22610
556.5	18/1	0.879	20	175	125	1567	1162	13015
556.5	24/7	0.914	20	175	125	1602	1292	18810
556.5	26/7	0.927	20	175	125	1615	1348	21470
636	18/1	0.940	20	175	125	1628	1290	14915
636	26/7	0.990	20	175	125	1678	1501	23940
795	26/7	0.1107	20	175	125	1795	1781	29925
795	45/7	0.1063	20	175	125	1751	1559	20995

AAAC Conductor 35 kV System

Size AWG/Kcmil	Number of Strands	Conductor Diameter	Bare AAAC Codename	ACSR equivalent diameter	Conductor Shield Thickness	Inner Layer Thickness	Outer Layer Thickness	Approximate Outside Diameter	Approximate Net Weight	Rated Strength
		in		AWG/Kcmil	mils	mils	mils	in	lb/kft	lbs
123.3	7	0.398	AZUSA	1/0	15	175	125	1076	436	3843
155.4	7	0.447	ANAHEIM	2/0	15	175	125	1125	490	4851
195.7	7	0.502	AMHERST	3/0	15	175	125	1180	554	6111
246.9	7	0.563	ALLIANCE	4/0	15	175	125	1251	640	7704
312.8	19	0.642	BUTTE	266.8	15	175	125	1330	733	9450
394.5	19	0.72	CANTON	336.4	15	175	125	1408	847	11970
465.4	19	0.783	CAIRO	397.5	15	175	125	1471	945	14040
559.5	19	0.858	DARIEN	477	20	175	125	1546	1070	16920
652.4	19	0.927	ELGIN	556.5	20	175	125	1625	1202	19710
740.8	37	0.99	FLINT	636	20	175	125	1688	1299	21960

The above data are approximate and subject to normal manufacturing tolerances.

Spacer Cable

Description:

Covered conductors consist of stranded hard drawn aluminium conductors with either one, two or three extruded layers depending on the voltage rating. Covered conductors are available in black or gray depending on visual preference.

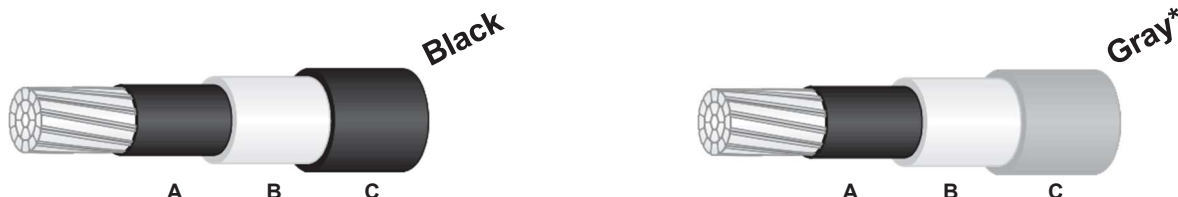
Benefits:

- Covering prevents faults due to contact
- Proprietary, high density outer layer resists abrasion, electrical tracking and UV degradation.
- Reduced NESC phase spacing is possible due to high impulse strength covering.

Application:

Covered conductors are designed to be used in spacer cable systems. Conductors are suspended from the messenger using Hendrix polyethylene spacers. Covered conductors are rated for continuous operation at 75°C.

15kV



A 0.015" Semiconducting Polyethylene (0.020" for 477 kcmil and larger)

B 0.075" Natural Low Density Polyethylene (0.080" for 795 kcmil)

C 0.075" Black or Gray Track Resistant High Density Polyethylene (0.080" for 795 kcmil)

S.no	Size	Strands	Type	Conductor Diameter (in)	Finished Cable Diameter (in)	Cable Weight (lbs/1000 ft)
1	#2 AWG	7	Round	0.292	0.622	170
2	1/0 AWG	7	Compact	0.336	0.666	215
3	2/0 AWG	7	Compact	0.376	0.706	251
4	3/0 AWG	7	Compact	0.423	0.753	297
5	4/0 AWG	7	Compact	0.475	0.805	351
6	266.8 kcmil	7	Compact	0.537	0.867	416
7	336.4 kcmil	19	Compact	0.603	0.933	497
8	397.5 kcmil	19	Compact	0.659	0.989	568
9	477.0 kcmil	19	Compact	0.722	1.062	662
10	556.5 kcmil	19	Compact	0.780	1.120	752
11	636.0 kcmil	19	Compact	0.835	1.175	839
12	795.0 kcmil	19	Compact	0.932	1.292	1,049

25kV



A 0.015" Semiconducting Polyethylene (0.020" for 477 kcmil and larger)

B 0.075" Natural Low Density Polyethylene (0.080" for 795 kcmil)

C 0.075" Black or Gray Track Resistant High Density Polyethylene
(0.080" for 795 kcmil)

S.no	Size	Strands	Type	Conductor Diameter (in)	Finished Cable Diameter (in)	Cable Weight (lbs/1000 ft)
1	#2 AWG	7	Round	0.292	0.822	270
2	1/0 AWG	7	Compact	0.336	0.866	321
3	2/0 AWG	7	Compact	0.376	0.906	363
4	3/0 AWG	7	Compact	0.423	0.953	414
5	4/0 AWG	7	Compact	0.475	1.005	476
6	266.8 kcmil	7	Compact	0.537	1.067	550
7	336.4 kcmil	19	Compact	0.603	1.133	640
8	397.5 kcmil	19	Compact	0.659	1.189	718
9	477.0 kcmil	19	Compact	0.722	1.262	815
10	556.5 kcmil	19	Compact	0.780	1.320	912
11	636.0 kcmil	19	Compact	0.835	1.375	1,005
12	795.0 kcmil	19	Compact	0.932	1.472	1,211

35kV



A 0.015" Semiconducting Polyethylene (0.020" for 477 kcmil and larger)

B 0.225" Natural Low Density Polyethylene

C 0.175" Black or Gray Track Resistant High Density Polyethylene

S.no	Size	Strands	Type	Conductor Diameter (in)	Finished Cable Diameter (in)	Cable Weight (lbs/1000 ft)
1	1/0 AWG	7	Compact	0.336	0.966	384
2	2/0 AWG	7	Compact	0.376	1.006	429
3	3/0 AWG	7	Compact	0.423	1.053	483
4	4/0 AWG	7	Compact	0.475	1.105	548
5	266.8 kcmil	7	Compact	0.537	1.167	625
6	336.4 kcmil	19	Compact	0.603	1.233	721
7	397.5 kcmil	19	Compact	0.659	1.289	803
8	477.0 kcmil	19	Compact	0.722	1.362	903
9	556.5 kcmil	19	Compact	0.780	1.420	1,004
10	636.0 kcmil	19	Compact	0.835	1.475	1,102
11	795.0 kcmil	19	Compact	0.932	1.572	1,315
