



Okoguard®-Okolene®

69kV Shielded-Concentric Wires

Primary Distribution and Underground Transmission Cable

Jacketed-Red Identification Stripes

Copper and Aluminum Conductors 105°C Rating



- A Conductor-Compressed or Compact Round Copper or Aluminum
- B Strand Screen - Extruded Semiconducting EPR
- C Insulation-Okoguard-EPR
- D Insulation Screen - Extruded Semiconducting EPR
- E Concentric Conductor-Bare Copper Wires
- F Extruded Okolene Jacket with 3 extruded red stripes

Insulation

Okoguard® is Okonite's registered trade name for its exclusive ethylene-propylene rubber (EPR) based, thermosetting compound, whose optimum balance of electrical and physical properties is unequaled in other solid dielectrics. Okoguard insulation, with the distinctive red color and a totally integrated EPR system, provides the optimum balance of electrical and physical properties for long, problem-free service.

Ethylene-propylene rubber screens are extruded over the conductor and the insulation. The triple tandem extrusion of these screens with the insulation provides optimum electrical characteristics.

The bare copper concentric wires are uniformly spaced around the insulation screen. The overall polyethylene jacket provides protection against mechanical damage and corrosion.

Product identification is provided through the use of three red stripes placed 120° apart in the black jacket.

Applications

Okoguard-Okolene 69kV cables are for use as primary circuits in electrical utility and industry applications where they provide maximum circuit security and economical installation. Rated 105°C for continuous operating temperature. Okoguard 69kV cables may be installed in wet or dry locations indoors or outdoors (exposed to sunlight) in underground ducts, conduits or direct burial.

Specifications

Conductors: Uncoated copper sizes 250 through 1000 kcmil are compact round strand per ASTM B496. Uncoated copper sizes larger than 1000 kcmil are compressed Class B strand per ASTM B3 and ASTM B8. Aluminum conductors are compressed Class B strand per ASTM B231 & B609.

Conductor Screen: Extruded semiconducting ethylene-propylene rubber meets or exceeds the requirements of ICEA S-108-720 and AEIC CS9.

Insulation: Extruded Okoguard meets or exceeds the requirements of ICEA S-108-720 and AEIC CS9.

Insulation Screen:

Extruded semiconducting EPR insulation screen. Meets or exceeds electrical and physical requirements of ICEA S-108-720 and AEIC CS9. Available with strippable or bonded screen.

Concentric Conductor: Bare copper concentric neutral wires helically applied sized 1/3, 1/6 or 1/12 or based on fault current requirements. Optional shields include a combination of copper tape and wires or a longitudinal corrugated copper tape. A C-L-X® armor covering is also available.

Jacket: Black OKOLENE LLDPE with red extruded stripes that meets and exceeds the requirements of ICEA S-108-720 and AEIC CS9. Optional jackets include FR-PVC OKOSEAL®, OKOLON TP-CPE®, OKOCLEAR TP® (TPPO-low smoke zero halogen) and when specified, a thermoset jacket or semi-conducting outer layer.

Product Features

- Triple tandem extruded, all EPR system.
- Okoguard cables meet or exceed AEIC and ICEA standards.
- Improved temperature rating. Okoguard insulation system has been tested and qualified for operation at 105°C continuous and 140°C emergency operating temperature.
- 250°C short circuit rating.
- Excellent corona resistance.
- Low dielectric constant and power factor.
- Screens are clean stripping.
- Exceptional resistance to "treeing".
- Moisture resistant.
- Excellent resistance to most chemicals.

Design Options:

- Triplexed or Paralleled.
- Additional conductor sizes.
- Filled Strand conductors.
- Tinned copper wires.
- Water blocking powder or tape.
- Product identification via colored jackets.
- Available with strippable or bonded screen.

Okoguard®-Okolene®

69kV Underground Primary Distribution Cable

Jacketed-Red Identification Stripes

Product Data

Section 2: Sheet 64

Catalog Number	Conductor Size AWG/kcmil	Neutral Size	Neutral Wires Num x AWG	Nominal Dia. over Insulation (in.)	Nominal Dia. over Screen (in.)	Jacket Thickness (mils)	Nominal OD (in.)	Approx. Net Weight (lbs./1000')	Approx. Strip Weight (lbs./1000')	Ampacity Duct Bank(1)	Ampacity Direct Bury(1)	Conduit Size(2)
Copper Conductors 650 mils Okoguard - Conc. Neutrals - Okolene Jacket 69kV												
140-22-3010	250(37x)	1/3	14x12	1.91	2.05	110	2.44	3272	3681	424	483	3.5
140-22-3012	250(37x)	1/6	11x14	1.91	2.05	110	2.41	3092	3501	440	496	3.5
140-22-3014	350(37x)	1/3	18x12	2.00	2.14	110	2.53	3799	4279	487	564	3.5
140-22-3016	350(37x)	1/6	15x14	2.00	2.14	110	2.50	3590	4021	512	585	3.5
140-22-3018	500(37x)	1/3	18x.0953	2.12	2.26	110	2.68	4620	5745	556	646	4
140-22-3020	500(37x)	1/6	13x12	2.12	2.26	110	2.65	4342	5467	591	683	4
140-22-3022	750(61x)	1/3	24x.1010	2.30	2.43	140	2.93	6027	6789	637	736	5
140-22-3024	750(61x)	1/6	12x10	2.30	2.43	140	2.93	5675	6437	673	778	5
140-22-3026	1000(61x)	1/3	24x.1167	2.44	2.58	140	3.11	7335	8255	700	809	5
140-22-3028	1000(61x)	1/6	16x10	2.44	2.58	140	3.08	6803	7723	717	837	5
140-22-3030	1250(91x)	1/6	16x9	2.64	2.77	140	3.30	8092	9025	756	866	5
140-22-3032	1250(91x)	1/12	16x12	2.64	2.77	140	3.23	7659	8592	830	973	5
140-22-3034	1500(91x)	1/6	24x10	2.77	2.90	140	3.40	9155	10088	1267	1374	5
140-22-3036	1500(91x)	1/12	20x12	2.77	2.90	140	3.36	8721	9654	1265	1373	5
140-22-3038	1750(127x)	1/6	28x10	2.91	3.05	140	3.55	10411	11433	1363	1475	5
140-22-3040	1750(127x)	1/12	14x10	2.91	3.05	140	3.55	9979	11001	1363	1475	5
140-22-3042	2000(127x)	1/6	32x10	3.03	3.16	140	3.66	11516	14328	1446	1563	5
140-22-3044	2000(127x)	1/12	16x10	3.03	3.16	140	3.66	11023	13835	1446	1563	5
140-22-3046	2250(127x)	1/6	29x9	3.14	3.28	140	3.80	12614	14454	1540	1645	6
140-22-3048	2250(127x)	1/12	18x10	3.14	3.28	140	3.78	11991	14803	1539	1644	6
140-22-3050	2500(127x)	1/6	32x9	3.21	3.35	140	3.87	13774	15614	1606	1713	6
140-22-3052	2500(127x)	1/12	20x10	3.21	3.35	140	3.85	13096	14936	1605	1712	6
140-22-3054	*2750(124x)	1/6	35x9	3.30	3.44	140	4.03	14745	17143	1667	1776	6
140-22-3056	*2750(127x)	1/12	18x9	3.30	3.44	140	4.03	14046	16444	1668	1776	6
140-22-3058	*3000(169x)	1/6	38x9	3.39	3.53	140	4.12	15725	18123	1728	1837	6
140-22-3060	*3000(169x)	1/12	19x9	3.39	3.53	140	4.12	14944	17342	1727	1836	6

Okonite's web site, www.okonite.com contains the most up to date information.

*Separator tape applied over wires.

(1) Ampacity Conditions

Ampacities are calculated using the Neher-McGrath methods of estimating the steady-state temperature of electrical power cables with the IEEE 835-1994 configurations noted below.

Duct Bank:

69kV 250-3000 kcmil

Configuration: 3 single cables in geometry (g).

Single circuit in underground duct with 12" spacing between conductors.

Single duct bank, 30" to top of duct bank, 75% Load Factor, 60°C-cm/W (RHO) concrete.

Ambient temperature of 20°C and soil thermal resistivity (RHO) of 90°C-cm/W.

Direct Buried:

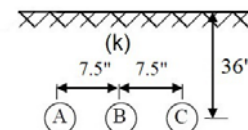
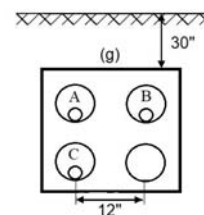
69kV 250-3000 kcmil

Configuration: 3 single cables in geometry (k).

Single circuit directly buried 36" deep underground with 7 1/2" flat spacing between conductors.

75% Load Factor, ambient temperature of 20°C and soil thermal resistivity (RHO) of 90°C-cm/W.

Multi-point grounded except copper sizes 1500, 1750, 2000, 2250, 2500 and 2750 kcmil and aluminum sizes 2000, 2250, 2500, 2750 and 3000 where the shields are open circuit (single point grounded).



Ampacities for other configurations available upon request. Contact your local Okonite sales representative.

(2) Recommended size of rigid nonmagnetic or nonmetallic conduit for a single conductor based on 53% maximum fill.

Okoguard®-Okolene®

69kV Underground Primary Distribution Cable

Jacketed-Red Identification Stripes

Product Data

Section 2: Sheet 64

Catalog Number	Conductor Size AWG/kcmil	Neutral Size	Neutral Wires Num x AWG	Nominal Dia. over Insulation (in.)	Nominal Dia. over Screen (in.)	Jacket Thickness (mils)	Nominal OD (in.)	Approx. Net Weight (lbs./1000')	Approx. Ship Weight (lbs./1000')	Ampacity Duct Bank(1)	Ampacity Direct Bury(1)	Conduit Size(2)
Aluminum 650 mils Okoguard - Conc. Neutrals - Okolene Jacket 69kV												
160-22-3010	250(37x)	1/3	13x14	1.94	2.08	110	2.44	2653	3084	352	395	3.5
160-22-3012	250(37x)	1/6	10x16	1.94	2.08	110	2.42	2537	2946	358	400	3.5
160-22-3014	350(37x)	1/3	18x14	2.05	2.18	110	2.55	2973	3453	413	469	3.5
160-22-3016	350(37x)	1/6	14x16	2.05	2.18	110	2.52	2825	3305	426	479	3.5
160-22-3018	500(37x)	1/3	16x12	2.18	2.31	110	2.71	3457	4221	486	555	4
160-22-3020	*500(37x)	1/6	13x14	2.18	2.31	110	2.70	3251	4015	507	573	4
160-22-3022	750(61x)	1/3	16x.0966	2.37	2.51	140	2.99	4300	5425	571	655	5
160-22-3024	750(61x)	1/6	12x12	2.37	2.51	140	2.96	4034	4798	605	688	5
160-22-3026	1000(61x)	1/3	18x.1052	2.52	2.66	140	3.16	4967	5620	627	724	5
160-22-3028	1000(61x)	1/6	16x12	2.52	2.66	140	3.11	4596	5235	665	766	5
160-22-3030	1100(61x)	1/3	22x10	2.51	2.64	140	3.14	5096	5749	637	736	5
160-22-3032	1100(61x)	1/6	18x12	2.51	2.64	140	3.10	4692	5331	673	778	5
160-22-3034	*1100(61x)	1/12	14x14	2.51	2.64	140	3.09	4468	5107	734	837	5
160-22-3036	1250(91x)	1/6	20x12	2.64	2.77	140	3.23	5109	5762	706	820	5
160-22-3038	1250(91x)	1/12	16x14	2.64	2.77	140	3.20	4857	5510	773	888	5
160-22-3040	1500(91x)	1/6	15x10	2.77	2.90	140	3.40	5726	6659	739	862	5
160-22-3042	*1500(91x)	1/12	19x14	2.77	2.90	140	3.35	5365	6298	813	942	5
160-22-3044	1750(127x)	1/6	17x10	2.93	3.07	140	3.57	6316	7338	768	900	5
160-22-3046	*1750(127x)	1/12	22x14	2.93	3.07	140	3.51	5928	6950	846	986	5
160-22-3048	2000(127x)	1/6	20x10	3.03	3.16	140	3.66	6825	8736	1185	1285	5
160-22-3050	*2000(127x)	1/12	16x12	3.03	3.16	140	3.64	6419	7441	1183	1284	5
160-22-3052	2250(127x)	1/6	22x10	3.12	3.25	140	3.75	7278	9189	1268	1360	6
160-22-3054	*2250(127x)	1/12	18x12	3.12	3.25	140	3.73	6848	8759	1267	1359	6
160-22-3056	2500(127x)	1/6	20x9	3.21	3.35	140	3.87	7848	9759	1337	1432	6
160-22-3058	*2500(127x)	1/12	20x12	3.21	3.35	140	3.83	7305	9216	1334	1430	6
160-22-3060	*2750(127x)	1/6	22x9	3.30	3.44	140	3.98	8131	10042	1399	1496	6
160-22-3052	*2750(127x)	1/12	22x12	3.30	3.44	140	3.91	7613	9524	1396	1494	6
160-22-3064	*3000(169x)	1/6	24x9	3.39	3.52	140	4.06	8579	10490	1456	1554	6
160-22-3066	*3000(169x)	1/12	24x12	3.39	3.52	140	4.00	8019	9930	1453	1552	6

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*Separator tape applied over wires.

1100 kcmil Compact Class A Strand.

(1) Ampacity Conditions

Ampacities are calculated using the Neher-McGrath methods of estimating the steady-state temperature of electrical power cables with the IEEE 835-1994 configurations noted below.

Duct Bank:

69kV 250-3000 kcmil

Configuration: 3 single cables in geometry (g).

Single circuit in underground duct with 12" spacing between conductors.

Single duct bank, 30" to top of duct bank, 75% Load Factor, 60°C-cm/W (RHO) concrete.

Ambient temperature of 20°C and soil thermal resistivity (RHO) of 90°C-cm/W.

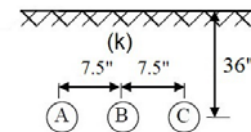
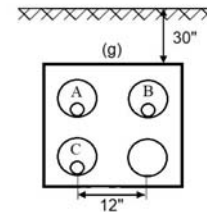
Direct Buried:

69kV 250-3000 kcmil

Configuration: 3 single cables in geometry (k).

Single circuit directly buried 36" deep underground with 7 1/2" flat spacing between conductors.

75% Load Factor, ambient temperature of 20°C and soil thermal resistivity (RHO) of 90°C-cm/W.



Multi-point grounded except copper sizes 1500, 1750, 2000, 2250, 2500 and 2750 kcmil and aluminum sizes 2000, 2250, 2500, 2750 and 3000 where the shields are open circuit (single point grounded).

Ampacities for other configurations available upon request. Contact your local Okonite sales representative.

(2) Recommended size of rigid nonmagnetic or nonmetallic conduit for a single conductor based on 53% maximum fill.

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