

ULTROL[®] 60+

Cable solutions to meet the application needs of nuclear power plants today and into the future



PRYSMIAN DELIVERS

Quality Assurance, Manufacturing Excellence and Unwavering Dedication

100% Quality Assurance Guaranteed

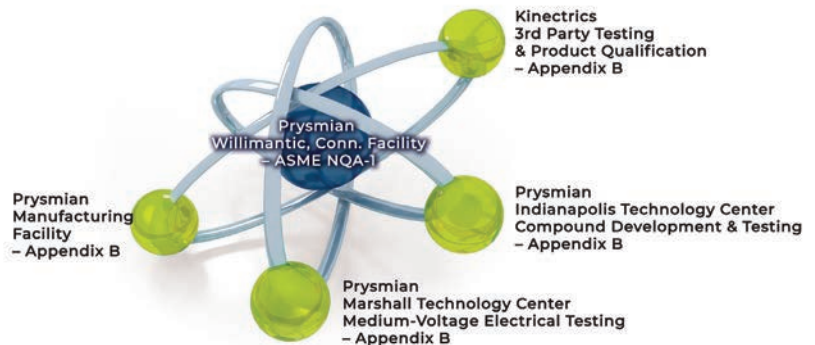
For more than a century, Prysmian has been 100 percent committed to ongoing improvement and quality assurance across all aspects of our business. We continually strive to develop, produce and deliver products that meet our customers' highest standards for performance, quality, value, service life and safety.

Under ASME NQA-1, 10CFR50 Appendix B and CSA Z299.1 quality assurance programs that include a highly experienced nuclear quality team, Prysmian ensures every reel of ULTROL® 60+ leaving the plant meets stringent industry standards and the specified needs of our customers. Every ULTROL® 60+ cable is followed through the entire manufacturing process—from raw material inspection to rigorous performance testing. Every reel includes inspection results and certified documentation that is maintained and traceable.

Prysmian's quality assurance system for design, manufacturing and testing includes:

- ASME NQA-1:1994 and NQA-1:2008 with 2009 supplemental
- ISO 9001:2008 Certified (UL/DQS registered)
- ANSI N45.2
- NUREG 0800 Section 17.5
- Nuclear Regulatory Commission US NRC 10CFR50 Appendix B, 10CFR21 compliant
- CSA Z299.1:1985
- CSA Category Program for Testing (2nd party approval to ISO 17025)
- UL Data Acceptance Program (2nd party approval to ISO 17025)
- NUPIC and NIAC – Audited Quality System

NQA-1 & Appendix B Suppliers



Lifelong Manufacturing Excellence

Having produced ULTROL® since 1970, Prysmian's Willimantic, Connecticut facility is founded on a legacy of having the vision, innovation and cable expertise to lead markets that require specialized cable solutions. Today, Willimantic is an ISO 9001-certified manufacturing plant with dedicated associates who provide the technical expertise, and quality manufacturing and testing capabilities to maintain its nuclear status—all assured through regular NQA-1 and Appendix B audits by the Nuclear Procurement Issues Committee (NUPIC), Nuclear Industry Assessment Committee (NIAC) and other quality assurance organizations.

Dedicated to manufacturing excellence, the ASME NQA-1 Tier-1 Willimantic facility features some of the most advanced technology of its kind, offering unmatched reliability and production processes. The Willimantic facility is supported by Appendix B Tier-2 manufacturing capabilities, extensive testing and advanced material development at Prysmian's state-of-the-art technology centers.

Extensive third-party testing, performed by an Appendix B supplier, ensures the conformance of ULTROL® 60+ to all nuclear requirements.



Meeting the needs of nuclear power plants **TODAY AND INTO THE FUTURE**

The nuclear power industry demands solutions that deliver high safety performance without fail and provide sustained reliability under rigorous conditions.

Building upon over 50 years of nuclear experience, Prysmian has combined advanced materials with manufacturing expertise to produce **ULTROL® 60+** Class 1E nuclear-qualified cables.

Third-party tested to meet Generation III reactor requirements, **ULTROL® 60+** cables exceed stringent industry standards and specifications to provide a 60-year-plus service life to optimize nuclear power plant operations *TODAY AND INTO THE FUTURE.*



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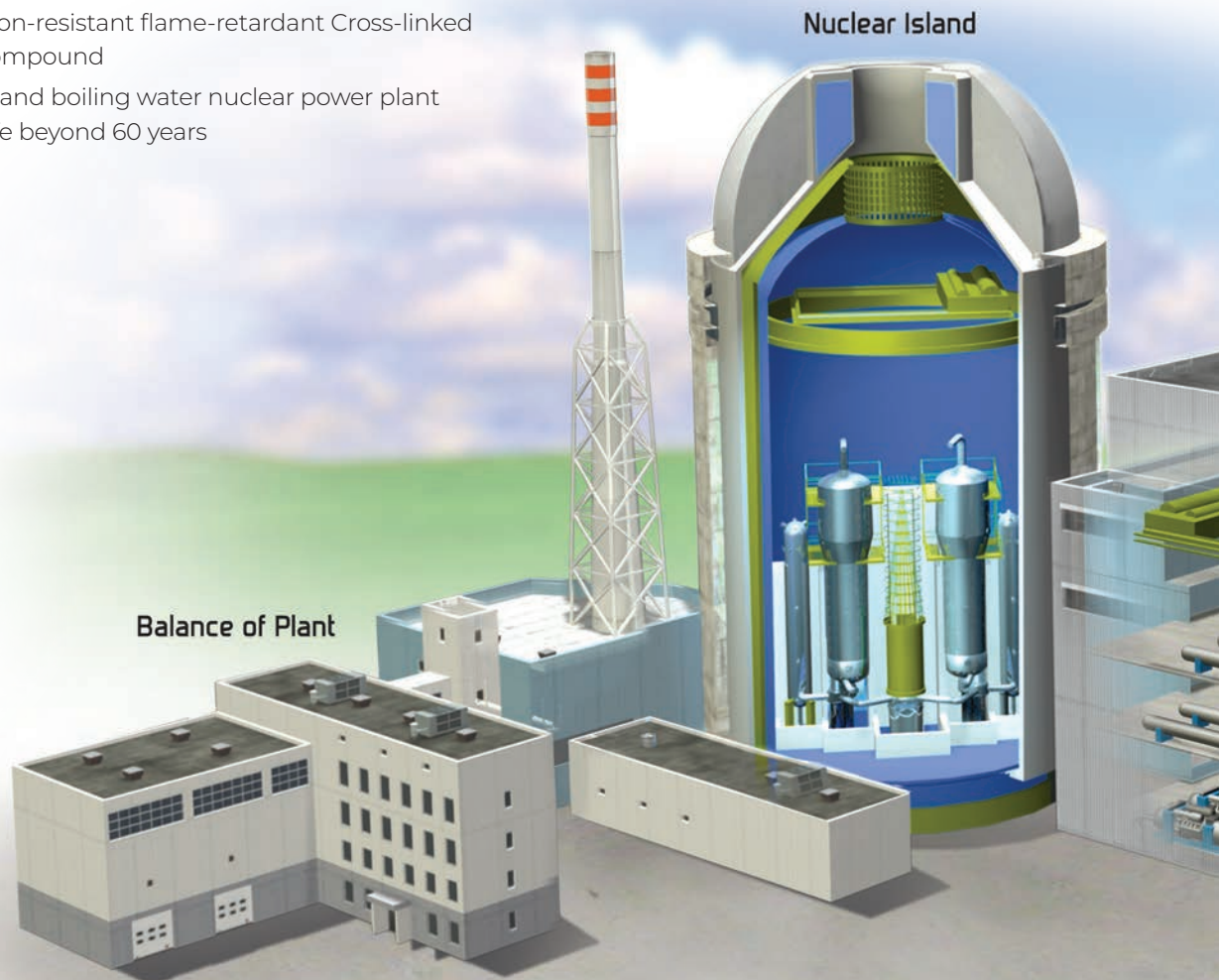
PRYSMIAN DELIVERS

Cable Solutions to meet the Application Needs of the Nuclear Power Plant

The ULTROL® 60+ product line provides a full line of nuclear generating station cables for both inside and outside containment—all qualified for a 60-year service life. ULTROL® 60+ cables meet the application needs of the nuclear power industry, delivering reliable low- and medium-voltage power to ensure efficient power production as well as distribution and control, while transmitting the information needed for plant safety, critical monitoring and accurate measurement.

From the nuclear island, turbine island and balance of the plant to the grid infrastructure, ULTROL® 60+ delivers optimized reliable operation, maintenance and management in all known reactor environments.

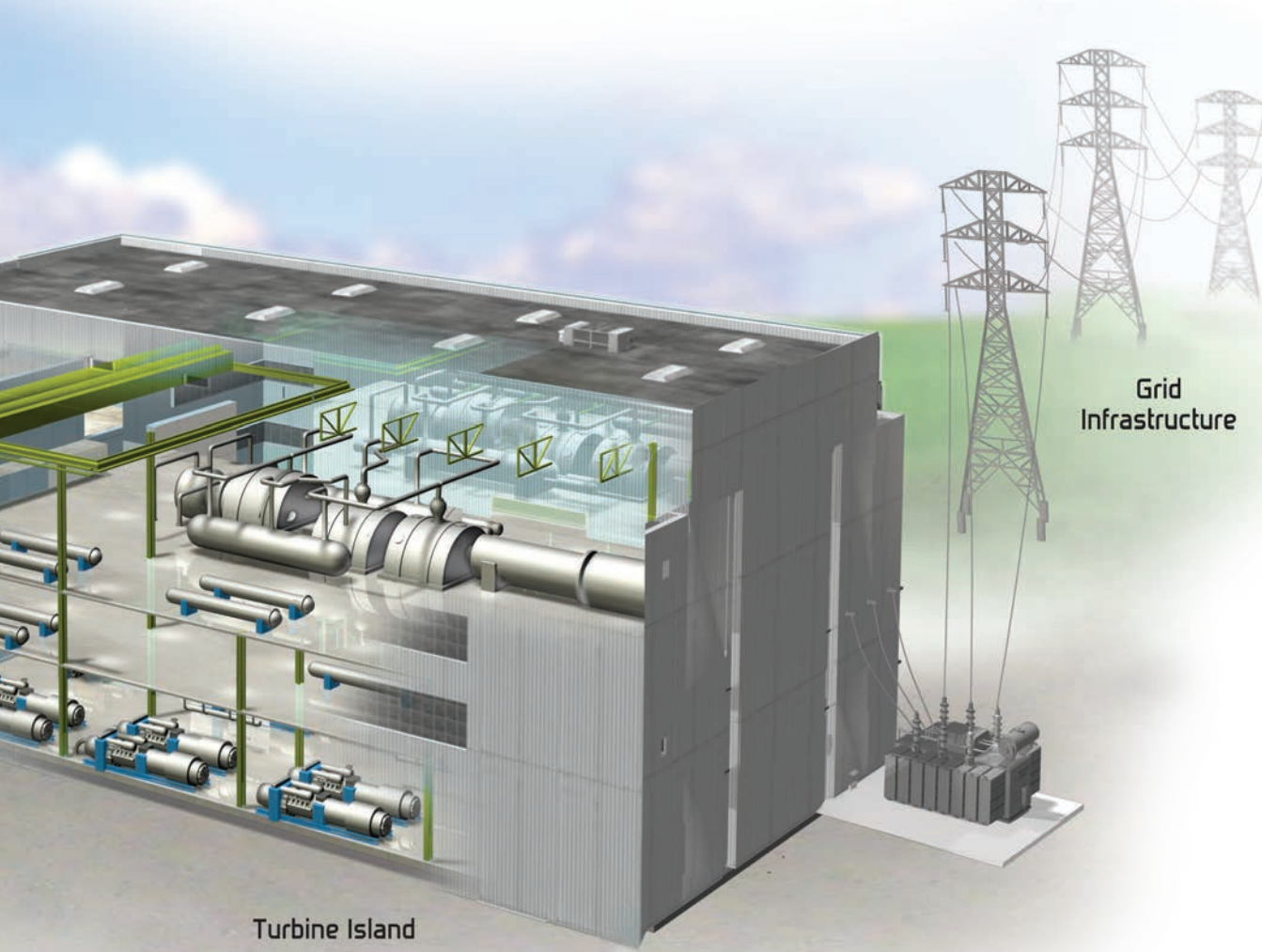
- Exceeds 60-year service life requirements for insulations, shields and jackets
- Meets requirements of IEEE 323 and IEEE 383
- Meets the required flame testing of IEEE 1202 and IEEE 383
- Meets/exceeds LOCA (loss-of-coolant accident) and HELB (high-energy line break) environmental qualification testing after simulated 60 year thermal and 350MRad radiation aging
- Provides excellent wet electrical (submersion) performance upon aging at 90°C over two years
- Offers new tougher, abrasion-resistant flame-retardant Cross-linked Polyolefin (XLPO) jacket compound
- Meets current pressurized and boiling water nuclear power plant requirements for service life beyond 60 years



Nuclear Application and Product Cross-Reference			Low-Voltage Cables							Medium-Voltage Cables		High- & Extra-High-Voltage Cables	
Standard: IEEE		Application	Switchboard (SIS)	Instrumentation	Thermocouple	Control	Power	Copper Communication	Industrial-Grade Tray Cable Industrial Power Cable	Power	MV-105 Copper Wire Shield MV-105 Copper Tape Shield	Underground Transmission	Overhead Transmission
Class 1E	Safety Related*	Nuclear Island											
		• Inside Containment • Harsh Environment	✓	✓	✓	✓	✓			✓			
		• Outside Containment • Mild Environment	✓	✓	✓	✓	✓			✓			
Non-Class 1EE**	Safety Significant	• Inside Containment • Outside Containment	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	Non-Safety Related	Turbine Island	✓	✓	✓	✓	✓	✓	✓	✓	✓		
		Balance of Plant	✓	✓	✓	✓	✓	✓	✓	✓	✓		
		Grid Infrastructure											✓

- ✓ **ULTROL® 60+ Class 1E**
Comes with Certificate of Conformance; Certified Test Report (CTR): 10CFR50 Appendix B & 10CFR Part 21
* Post-LOCA long-term submergence test upon request
- ✓ **ULTROL® 60+ Class 1E (For Non-Class 1E applications)**
** Comes with Certificate of Conformance

- ✓ **Commerical-Grade Products**
Comes with Certificate of Conformance
- ✓ **Utility-Grade Products**
Comes with Certificate of Conformance



ULTROL® 60+ Cable Selection Guide

SPEC	DESCRIPTION	VOLTAGE	INSULATION/JACKET	CONDUCTOR SIZE/STRAND	IMAGE
ULTROL® 60+ CLASS 1E/SAFETY-RELATED LOW-VOLTAGE SIS SWITCHBOARD WIRE - TYPE SIS & TYPE SIS/XHHW-2 /RW90					
100-60	Single Conductor	600 V	FR-XLPE	18 AWG (0.82 mm ²) - 1000 kcmil (507 mm ²) Class B	
125-60	Single Conductor	600 V	FR-XLPE	18 AWG (0.82 mm ²) - 1000 kcmil (507 mm ²) Class K & H	
ULTROL® 60+ CLASS 1E/SAFETY-RELATED LOW-VOLTAGE POWER CABLE - TYPE RHH/RHW-2					
150-60	Single Conductor Heavy Wall	600 V	FR-XLPE	14 AWG (2.08 mm ²) - 1000 kcmil (507 mm ²) Class B	
175-60	Single Conductor Dual Wall	600 V	FR-XLPE / XLPO	14 AWG (2.08 mm ²) - 1000 kcmil (507 mm ²) Class B	
ULTROL® 60+ CLASS 1E/SAFETY-RELATED LOW-VOLTAGE THERMOCOUPLE EXTENSION CABLE					
185-60	1 - 12 Pairs Individually Shielded Overall Shield	600 V	FR-XLPE / XLPO	18 AWG (0.82 mm ²) and 16 AWG (1.31 mm ²) solid alloy	
ULTROL® 60+ CLASS 1E/SAFETY-RELATED LOW-VOLTAGE INSTRUMENTATION CABLE					
200-60	2 - 37 Multi-conductor	600 V	FR-XLPE / XLPO	18 AWG (0.82 mm ²) and 16 AWG (1.31 mm ²) Class B	
225-60	2 - 37 Multi-conductor Overall Shield	600 V	FR-XLPE / XLPO	18 AWG (0.82 mm ²) and 16 AWG (1.31 mm ²) Class B	
250-60	2 - 19 Pairs / Triads Individually Shielded Overall Shield	600 V	FR-XLPE / XLPO	18 AWG (0.82 mm ²) and 16 AWG (1.31 mm ²) Class B	
ULTROL® 60+ CLASS 1E/SAFETY-RELATED LOW-VOLTAGE CONTROL CABLE - TYPE TC-ER*					
275-60	2 - 37 Multi-conductor	600 V	FR-XLPE / XLPO	14 AWG (2.08 mm ²) - 10 AWG (5.26 mm ²) Class B	
300-60	2 - 37 Multi-conductor Overall Shield	600 V	FR-XLPE / XLPO	14 AWG (2.08 mm ²) - 10 AWG (5.26 mm ²) Class B	
ULTROL® 60+ CLASS 1E/SAFETY-RELATED LOW-VOLTAGE POWER CABLE - TYPE TC-ER					
325-60	3 or 4 Conductor with Ground	600 V	FR-XLPE / XLPO	8 AWG (8.36 mm ²) - 750 kcmil (380 mm ²) Class B	
ULTROL® 60+ CLASS 1E/SAFETY-RELATED MEDIUM-VOLTAGE POWER CABLE - TYPE MV-105					
340-60	Single Conductor Shielded	5 kV (133%) & 8 kV (100%)	EPR / XLPO	6 AWG (13.3 mm ²) - 1000 kcmil (507 mm ²) Class B	
		15 kV (133%)	EPR / XLPO	2 AWG (33.6 mm ²) - 1000 kcmil (507 mm ²) Class B	

* -ER for > 2 conductors

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ICON KEY



SAFETY RELATED



RADIATION-RESISTANT



FLAME-RETARDANT



MOISTURE-RESISTANT



UV/SUNLIGHT-RESISTANT



CROSS-LINKED



OIL-RESISTANT



INCREASED FLEXIBILITY



CUT-THROUGH



COLD BEND



COLD BEND



HEAVY WALL

ULTROL® 60+ SIS Switchboard Wire

Class B



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type SIS and Type SIS/XHHW-2/RW90



SAFETY
RELATED



RADIATION-
RESISTANT



FLAME-
RETARDANT



MOISTURE
RESISTANT



UV/SUNLIGHT-
RESISTANT



CROSS-
LINKED



CUT-
THROUGH



-40°C
COLD
BEND

Product Construction



1. Conductor:

- 18 AWG thru 1000 kcmil tinned annealed copper per ASTM B33; Class B stranding per ASTM B8

2. Insulation:

- Flame-retardant, heat-, moisture-, sunlight- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Gray

Print:

- For 18 AWG & 16 AWG:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXAWG COPPER FR-XLPE TYPE SIS 600V 90C VW-1 NUCLEAR DAY/MONTH/YEAR
- For 14 AWG thru 4/0 AWG:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXAWG COPPER FR-XLPE (UL) TYPE SIS/XHHW-2 600V 90C -40°C VW-1 NUCLEAR DAY/MONTH/YEAR
- **Note - Sizes 1/0AWG & larger include: TRACEABILITY NUMBER SEQUENTIAL FOOTAGE**
- For 250 kcmil thru 1000 kcmil:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXXKCMIL COPPER FR-XLPE (UL) TYPE XHHW-2 600V 90C -40°C VW-1 NUCLEAR DAY/MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Options:

- Conductor stranding
- ISO Metric conductor
- Colored insulation

Applications:

- ULTROL® 60+ SIS is a 600 V single conductor, thermoset insulated wire for use in Safety or Non-Safety Related switchboard and internal control panel wiring
- For use in Safety Related lead wire assemblies interconnecting pressure transmitters, switches, and sensors to control equipment where flame retardancy and radiation resistance is critical

Features:

- Rated at 90°C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend and impact test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- ICEA S-95-658
- UL 44 SIS/XHHW-2/RW90

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ SIS Switchboard Wire

Class B



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type SIS and Type SIS/XHHW-2/RW90

Catalog Number	Cond. Size (AWG/kcmil)	Cond. Strand	Minimum Avg. Insulation Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
			Inches	mm	Inches	mm	Lbs/1000 Ft	kg/km	Lb/1000 Ft	kg/km
10060.18.1	18	7/.0152	0.030	0.76	0.108	2.74	5	7	10	15
10060.16.1	16	7/.0192	0.030	0.76	0.118	2.99	8	12	14	21
10060.14.1	14	7/.0242	0.030	0.76	0.133	3.37	13	19	20	30
10060.12.1	12	7/.0305	0.030	0.76	0.152	3.86	20	30	28	42
10060.10.1	10	7/.0374	0.030	0.76	0.175	4.44	30	45	40	60
10060.8.1	8	7/.0473	0.045	1.14	0.236	5.99	48	71	68	101
10060.6.1	6	7/.0612	0.045	1.14	0.273	6.93	81	121	104	155
10060.4.1	4	7/.0755	0.045	1.14	0.319	8.10	123	183	152	226
10060.2.1	2	7/.0974	0.045	1.14	0.379	9.62	205	305	242	360
10060.1.1	1	19/.0664	0.055	1.40	0.437	11.10	258	384	305	453
10060.1/0.1	1/0	19/.0731	0.055	1.40	0.476	12.10	314	467	367	546
10060.2/0.1	2/0	19/.0820	0.055	1.40	0.516	13.10	395	587	454	675
10060.3/0.1	3/0	19/.0940	0.055	1.40	0.567	14.40	502	747	569	847
10060.4/0.1	4/0	19/.1039	0.055	1.40	0.621	15.80	634	943	709	1055
10060.250.1	250	37/.0822	0.065	1.65	0.695	17.60	772	1149	865	1287
10060.350.1	350	37/.0973	0.065	1.65	0.798	20.20	1081	1609	1192	1773
10060.500.1	500	37/.1162	0.065	1.65	0.927	23.50	1544	2297	1678	2497
10060.750.1	750	61/.1109	0.080	2.03	1.137	28.80	2316	3446	2507	3731
10060.1000.1	1000	61/.1280	0.080	2.03	1.287	32.60	3088	4595	3311	4927

Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ SIS Switchboard Wire

Class K & H



Class 1E Nuclear

600 V, 90°C, UL VW-1, Flexible, UL Type SIS and Type SIS/XHHW-2/RW90



SAFETY
RELATED



RADIATION-
RESISTANT



FLAME-
RETARDANT



MOISTURE
RESISTANT



UV/SUNLIGHT-
RESISTANT



CROSS-
LINKED



INCREASED
FLEXIBILITY



CUT-
THROUGH



COLD
BEND

Product Construction



1. Conductor:

- 18 AWG thru 10 AWG tinned annealed copper per ASTM B33; Class K stranding per ASTM B1748
- 8 AWG thru 1000 kcmil tinned annealed copper per ASTM B33; Class H stranding per ASTM B173

2. Insulation:

- Flame-retardant, heat-, moisture-, sunlight- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Gray

Print:

- For 18 AWG & 16 AWG:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXAWG COPPER FR-XLPE TYPE SIS 600V 90C VW-1 NUCLEAR DAY/MONTH/YEAR
- For 14 AWG thru 4/0 AWG:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXAWG COPPER FR-XLPE (UL) TYPE SIS/ XHHW-2 600V 90C -40°C VW-1 NUCLEAR DAY/MONTH/YEAR
- **Note - Sizes 1/0AWG & larger include: TRACEABILITY NUMBER SEQUENTIAL FOOTAGE**
- For 250 kcmil thru 1000 kcmil:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXXKCMIL COPPER FR-XLPE (UL) TYPE XHHW-2 600V 90C -40°C VW-1 NUCLEAR DAY/ MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Options:

- Conductor stranding
- ISO Metric conductor
- Colored insulation

Applications:

- ULTROL® 60+ SIS is a 600 V single conductor, thermoset insulated wire for use in Safety or Non-Safety Related switchboard and internal control panel wiring
- For use in Safety Related lead wire assemblies interconnecting pressure transmitters, switches, and sensors to control equipment where flame retardancy and radiation resistance is critical

Features:

- Rated at 90°C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend and impact test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015 and IEEE 383-1974/2003
- ICEA S-95-658
- UL 44 SIS/XHHW-2/RW90

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ SIS Switchboard Wire

Class K & H



Class 1E Nuclear

600 V, 90°C, UL VW-1, Flexible, UL Type SIS and Type SIS/XHHW-2/RW90

Catalog Number	Cond. Size (AWG/kcmil)	Cond. Strand	Minimum Avg. Insulation Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
			Inches	mm	Inches	mm	Lbs/1000 Ft	kg/km	Lb/1000 Ft	kg/km
12560.18.1	18	16/.010	0.030	0.76	0.107	2.71	5	7	10	15
12560.16.1	16	26/.010	0.030	0.76	0.117	2.97	8	12	13	19
12560.14.1	14	41/.010	0.030	0.76	0.132	3.35	13	19	19	28
12560.12.1	12	65/.010	0.030	0.76	0.155	3.93	20	30	28	42
12560.10.1	10	105/.010	0.030	0.76	0.172	4.37	33	49	42	63
12560.8.1	8	133/.0108	0.045	1.14	0.248	6.30	49	73	71	105
12560.6.1	6	133/.0142	0.045	1.14	0.299	7.59	82	122	111	165
12560.4.1	4	133/.0179	0.045	1.14	0.348	8.84	132	196	166	247
12560.2.1	2	133/.0223	0.045	1.14	0.423	10.70	210	312	256	381
12560.1.1	1	259/.0180	0.055	1.40	0.476	12.00	266	396	320	476
12560.1/0.1	1/0	259/.0201	0.055	1.40	0.528	13.40	334	497	395	587
12560.2/0.1	2/0	259/.0226	0.055	1.40	0.574	14.60	422	628	491	730
12560.3/0.1	3/0	259/.0253	0.055	1.40	0.634	16.10	523	778	602	896
12560.4/0.1	4/0	259/.0286	0.055	1.40	0.694	17.60	659	981	746	1110
12560.250.1	250	427/.0242	0.065	1.65	0.761	19.30	795	1183	903	1344
12560.350.1	350	427/.0286	0.065	1.65	0.874	22.10	1110	1652	1239	1844
12560.500.1	500	427/.0342	0.065	1.65	1.034	26.20	1590	2366	1751	2605
12560.750.1	750	703/.0327	0.080	2.03	1.286	32.60	2410	3586	2644	3935
12560.1000.1	1000	703/.0377	0.080	2.03	1.458	37.00	3205	4769	3480	5178

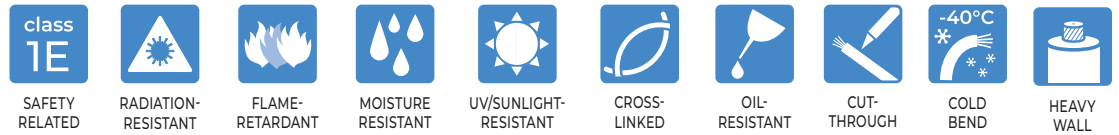
Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Power Cable Heavy Wall, Single Conductor

Class 1E Nuclear

600 V, 90°C, VW-1, UL Type RHH/RHW-2



Product Construction



1. Conductor:

- 14 AWG thru 1000 kcmil tinned annealed copper per ASTM B33; Class B stranding per ASTM B8

2. Insulation:

- Flame-retardant, heat-, moisture-, sunlight- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Black

Print:

- For 14 AWG thru 4/0 AWG:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXAWG COPPER FR-XLPE (UL) TYPE RHH/RHW-2 600V 90C -40°C VW-1 NUCLEAR DAY/MONTH/YEAR
Note - Sizes 1/0AWG & larger include: TRACEABILITY NUMBER SEQUENTIAL FOOTAGE
- For 250 kcmil thru 1000 kcmil:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXXKCMIL COPPER FR-XLPE (UL) TYPE RHH/RHW-2 600V 90C SUN RES -40°C VW-1 NUCLEAR DAY/MONTH/YEAR
TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Options:

- Conductor stranding
- ISO Metric conductor
- Colored insulation

Applications:

- ULTROL® 60+ power cable is a 600 V heavy wall, insulated single conductor, thermoset, Class 1E rated wire construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations where additional mechanical protection is required from a heavier insulation wall
- For use in Class 1E low-voltage power and lighting functions where optimum performance is required and where flame retardancy and radiation resistance is critical
- May be installed in trays, conduit or ducts

Features:

- Rated at 90°C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend and impact test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- ICEA S-95-658
- UL 44 RHH/RHW-2

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ Power Cable Heavy Wall, Single Conductor

Class 1E Nuclear

600 V, 90°C, VW-1, UL Type RHH/RHW-2



Catalog Number	Cond. Size (AWG/kcmil)	Cond. Strand	Minimum Avg. Insulation Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
			Inches	mm	Inches	mm	Lbs/1000 Ft	kg/km	Lb/1000 Ft	kg/km
15060.14.1	14	7/.0242	0.045	1.14	0.163	4.14	13	19	23	34
15060.12.1	12	7/.0305	0.045	1.14	0.182	4.62	20	30	34	51
15060.10.1	10	7/.0385	0.045	1.14	0.205	5.21	32	48	48	71
15060.8.1	8	7/.0486	0.060	1.52	0.266	6.76	51	76	78	116
15060.6.1	6	7/.0612	0.060	1.52	0.303	7.70	81	121	114	169
15060.4.1	4	7/.0772	0.060	1.52	0.350	8.89	129	192	169	251
15060.2.1	2	7/.0974	0.060	1.52	0.409	10.40	205	305	254	378
15060.1.1	1	19/.0664	0.080	2.03	0.488	12.40	258	384	329	490
15060.1/0.1	1/0	19/.0745	0.080	2.03	0.527	13.40	326	485	404	601
15060.2/0.1	2/0	19/.0837	0.080	2.03	0.572	14.50	411	612	498	741
15060.3/0.1	3/0	19/.0940	0.080	2.03	0.622	15.80	518	771	615	915
15060.4/0.1	4/0	19/.1055	0.080	2.03	0.678	17.20	653	972	761	1133
15060.250.1	250	37/.0822	0.095	2.41	0.754	19.20	772	1149	908	1351
15060.350.1	350	37/.0973	0.095	2.41	0.857	21.80	1081	1609	1241	1846
15060.500.1	500	37/.1162	0.095	2.41	0.986	25.00	1544	2297	1734	2580
15060.750.1	750	61/.1109	0.110	2.79	1.199	30.50	2316	3446	2581	3840
15060.1000.1	1000	61/.1280	0.110	2.79	1.349	34.30	3088	4595	3392	5048

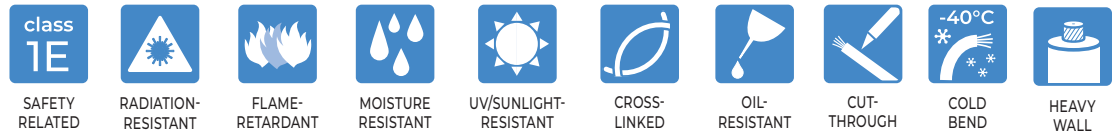
Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Power Cable Dual Wall, Single Conductor

Class 1E Nuclear

600 V, 90°C, VW-1, UL Type RHH/RHW-2



Product Construction



1. Conductor:

- 14 AWG thru 1000 kcmil tinned annealed copper per ASTM B33; Class B stranding per ASTM B8

2. Insulation:

- Flame-retardant, heat-, moisture-, sunlight- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: White

3. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyolefin (XLPO)
- Color code: Black

Print:

- For 14 AWG thru 4/0 AWG:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXAWG COPPER FR-XLPE (UL) TYPE RHH/RHW-2 600V 90C VW-1 NUCLEAR DAY/MONTH/YEAR

Note - Sizes 1/0AWG & larger include: TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

- For 250 kcmil thru 1000 kcmil:
PRYSMIAN (WC) ULTROL® 60+ 1/C XXXKCMIL COPPER FR-XLPE (UL) TYPE RHH/RHW-2 600V 90C SUN RES VW-1 NUCLEAR DAY/MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Options:

- Conductor stranding
- ISO Metric conductor

Applications:

- ULTROL® 60+ power cable is a 600 V dual wall, insulated single conductor, thermoset, Class 1E rated wire construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations and where additional jacket protection is required
- For use in Class 1E low-voltage power and lighting functions where optimum performance is required and where flame retardancy and radiation resistance is critical
- May be installed in trays, conduit or ducts

Features:

- Rated at 90 °C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- ICEA S-95-658
- UL 44 RHH/RHW-2

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ Power Cable Dual Wall, Single Conductor



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type RHH/RHW-2

Catalog Number	Cond. Size (AWG/kcmil)	Cond. Strand	Minimum Avg. Insulation Thickness		Minimum Avg. Jacket Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
			Inches	mm	Inches	mm	Inches	mm	Lbs/1000 Ft	kg/km	Lb/1000 Ft	kg/km
17560.14.1	14	7/0242	0.030	0.76	0.015	0.38	0.165	4.19	13	19	24	36
17560.12.1	12	7/0305	0.030	0.76	0.015	0.38	0.184	4.67	20	30	33	49
17560.10.1	10	7/0385	0.030	0.76	0.015	0.38	0.207	5.26	32	48	47	70
17560.8.1	8	7/0473	0.045	1.14	0.015	0.38	0.268	6.81	48	71	75	111
17560.6.1	6	7/0597	0.045	1.14	0.030	0.76	0.334	8.48	77	114	118	175
17560.4.1	4	7/0772	0.045	1.14	0.030	0.76	0.383	9.73	129	192	180	267
17560.2.1	2	7/0974	0.045	1.14	0.030	0.76	0.442	11.20	205	305	267	397
17560.1.1	1	19/0664	0.055	1.40	0.045	1.14	0.530	13.50	258	384	347	516
17560.1/0.1	1/0	19/0745	0.055	1.40	0.045	1.14	0.569	14.50	326	485	424	631
17560.2/0.1	2/0	19/0820	0.055	1.40	0.045	1.14	0.610	15.50	395	587	503	748
17560.3/0.1	3/0	19/0940	0.055	1.40	0.045	1.14	0.664	16.90	518	771	640	952
17560.4/0.1	4/0	19/1055	0.055	1.40	0.045	1.14	0.720	18.30	653	972	788	1172
17560.250.1	250	37/0822	0.065	1.65	0.065	1.65	0.829	21.10	772	1149	962	1432
17560.350.1	350	37/0973	0.065	1.65	0.065	1.65	0.932	23.70	1081	1609	1302	1937
17560.500.1	500	37/1162	0.065	1.65	0.065	1.65	1.061	27.00	1544	2297	1804	2685
17560.750.1	750	61/1109	0.080	2.03	0.065	1.65	1.271	32.30	2316	3446	2661	3960
17560.1000.1	1000	61/1280	0.080	2.03	0.065	1.65	1.421	36.10	3088	4595	3483	5183

Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Thermocouple Extension Cable

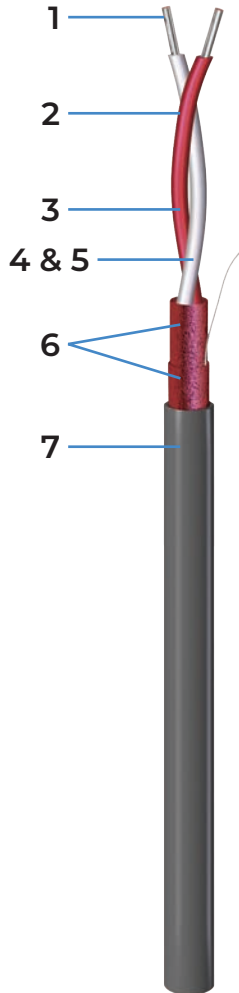
Individually Shielded Pairs, Overall Shield



Class 1E Nuclear
600 V, 90°C, VW-1



Product Construction



1. Conductor:

- 18AWG and 16AWG annealed, stranded 7/W thermocouple extension grade alloys calibrated to standard limits of error per ANSI-MC96.1, latest edition

2. Insulation:

- Flame-retardant, heat-, moisture- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)

3. Conductor Components:

- Insulated single conductors are matched and twisted into pairs

4. Color Code:

- Negative conductor is red; positive conductor is color coded per ANSI-MC96.1as follows:

Type	Pos. Cond.	Overall Jacket
JX	White	Black
EX	Purple	Black
KX	Yellow	Black
TX	Blue	Black

5. Cable Core:

- Conductor components are cables with non-hygroscopic fillers and an overall binder tape as necessary

6. Shields:

- Individually shielded: pairs are 100% shielded, helically applied with a copper/polyester tape in contact with a stranded tinned copper drain wire and an overall polyester electrical isolation tape
- Overall shield: copper/polyester tape in contact with a stranded tinned copper drain wire

7. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant thermoset, ULTROL® 60+ Cross-linked Polyolefin (XLPO) — Black

Print:

- PRYSMIAN (WC) ULTROL® 60+ XX/ PR XXAWG TYPE EX OR JX OR KX OR TX FR-XLPE XLPO SHIELDED 600V 90C DAY/ MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Applications:

- ULTROL® 60+ thermocouple extension cable is a 600 V individual shielded pairs with an overall shield, thermoset, Class 1E rated construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations
- Designed for use on critical circuits where total isolation is required between pairs and from external interference
- May be installed in trays, conduit or ducts

Features:

- Rated at 90°C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend and impact test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- ICEA S-73-532
- ANSI MC96.1

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels

Options:

- Other sizes and pair counts are available
- Special Limits of Error conductors are available



ULTROL® 60+ Thermocouple Extension Cable

Individually Shielded Pairs, Overall Shield



Class 1E Nuclear
600 V, 90°C, VW-1

Conductor Type	Conductor Size (AWG)	No. Of Pairs	Min. Avg. Insulation Thickness (Inches)	Drain Wire Size (AWG)	Min. Avg. Jacket Thickness (Inches)
JX, EX, KX, TX	18 and 16	1 - 12	.025	18 and 20	.045



ULTROL® 60+ Instrumentation Cable

Multi-Conductor

Class 1E Nuclear
600 V, 90°C, VW-1



SAFETY
RELATED



RADIATION-
RESISTANT



FLAME-
RETARDANT



MOISTURE
RESISTANT



UV/SUNLIGHT-
RESISTANT



CROSS-
LINKED



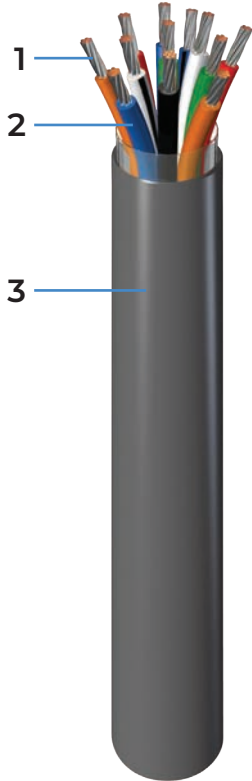
OIL-
RESISTANT



CUT-
THROUGH



COLD
BEND



Product Construction

1. Conductor:

- 18 AWG and 16 AWG tinned annealed copper per ASTM B33; Class B stranding per ASTM B8

2. Insulation:

- Flame-retardant, heat-, moisture- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Per ICEA Method 1, Table E-1

3. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyolefin (XLPO)
- Color code: Black

Print:

- PRYSMIAN (WC) ULTROL® 60+ XX/C XXAWG COPPER FR-XLPE XLPO 600V 90C SUN RES OIL RES I & II DIR BUR NUCLEAR DAY/MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Options:

- Conductor stranding
- ISO Metric conductor
- UL Type TC-ER (-ER for > 2 conductors) with 30 mil insulation wall thickness

Applications:

- ULTROL® 60+ instrumentation cable is a 600 V multi-conductor, thermoset, Class 1E rated construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations and where flame retardancy and radiation resistance is critical
- For use in Class 1E monitoring data recording and transmitting information on low energy circuits where shielding from external electrostatic interference is not required
- Can be installed in trays, conduit, ducts, or in direct burial applications

Features:

- Rated at 90 °C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- ICEA S-73-532

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ Instrumentation Cable

Multi-Conductor



Class 1E Nuclear
600 V, 90°C, VW-1

Catalog Number	No. of Cond.	Cond. Size (AWG)	Cond. Strand	Minimum Avg. Insulation Thickness		Minimum Avg. Jacket Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
				Inches	mm	Inches	mm	Inches	mm	Lbs/1000 Ft	kg/km	Lb/1000 Ft	kg/km
20060.18.2	2	18	7/0152	0.025	0.64	0.045	1.14	0.290	7.36	10	15	40	59
20060.18.3	3	18	7/0152	0.025	0.64	0.045	1.14	0.305	7.75	15	22	52	77
20060.18.4	4	18	7/0152	0.025	0.64	0.045	1.14	0.340	8.64	20	30	76	113
20060.18.5	5	18	7/0152	0.025	0.64	0.045	1.14	0.370	9.40	25	37	84	125
20060.18.7	7	18	7/0152	0.025	0.64	0.045	1.14	0.400	10.16	35	52	104	155
20060.18.9	9	18	7/0152	0.025	0.64	0.045	1.14	0.460	11.68	46	68	129	192
20060.18.12	12	18	7/0152	0.025	0.64	0.045	1.14	0.515	13.08	51	76	165	246
20060.18.19	19	18	7/0152	0.025	0.64	0.060	1.52	0.630	16.00	96	143	255	379
20060.18.25	25	18	7/0152	0.025	0.64	0.060	1.52	0.730	18.54	127	189	327	486
20060.18.30	30	18	7/0152	0.025	0.64	0.060	1.52	0.765	19.43	151	225	372	554
20060.18.37	37	18	7/0152	0.025	0.64	0.060	1.52	0.830	21.08	188	280	451	671
20060.16.2	2	16	7/0192	0.025	0.64	0.045	1.14	0.315	8.00	16	24	50	74
20060.16.3	3	16	7/0192	0.025	0.64	0.045	1.14	0.330	8.38	24	36	64	95
20060.16.4	4	16	7/0192	0.025	0.64	0.045	1.14	0.365	9.27	37	55	87	129
20060.16.5	5	16	7/0192	0.025	0.64	0.045	1.14	0.395	10.03	40	60	104	155
20060.16.7	7	16	7/0192	0.025	0.64	0.045	1.14	0.430	10.92	57	84	135	201
20060.16.9	9	16	7/0192	0.025	0.64	0.045	1.14	0.490	12.45	73	108	170	263
20060.16.12	12	16	7/0192	0.025	0.64	0.060	1.52	0.590	15.00	97	144	233	346
20060.16.19	19	16	7/0192	0.025	0.64	0.060	1.52	0.680	17.27	154	229	335	498
20060.16.25	25	16	7/0192	0.025	0.64	0.060	1.52	0.790	20.07	203	302	427	635
20060.16.30	30	16	7/0192	0.025	0.64	0.060	1.52	0.880	22.35	244	363	543	808
20060.16.37	37	16	7/0192	0.025	0.64	0.080	2.03	0.945	24.00	300	446	648	964

Insulated conductor diameter (inches) 18 AWG (.10) and 16 AWG (.11).
Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Instrumentation Cable Multi-Conductor, Overall Shield



Class 1E Nuclear
600 V, 90°C, VW-1



SAFETY
RELATED



RADIATION-
RESISTANT



FLAME-
RETARDANT



MOISTURE
RESISTANT



UV/SUNLIGHT-
RESISTANT



CROSS-
LINKED



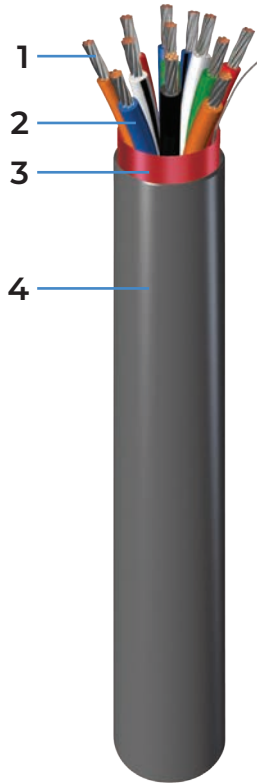
OIL-
RESISTANT



CUT-
THROUGH



COLD
BEND



Product Construction

1. Conductor:

- 18 AWG and 16 AWG tinned annealed copper per ASTM B33; Class B stranding per ASTM B8

2. Insulation:

- Flame-retardant, heat-, moisture- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Per ICEA Method 1, Table E-1

3. Overall Shield:

- Copper/polyester tape in contact with a stranded tinned copper drain wire

4. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyolefin (XLPO)
- Color code: Black

Print:

- PRYSMIAN (WC) ULTROL® 60+ XX/C XXAWG COPPER FR-XLPE XLPO SHIELDED 600V 90C SUN RES OIL RES I & II DIR BUR NUCLEAR DAY/MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Options:

- Conductor stranding
- ISO Metric conductor
- Tinned copper braid shield
- UL Type TC-ER (-ER for > 2 conductors) with 30 mil insulation wall thickness

Applications:

- ULTROL® 60+ instrumentation cable is a 600 V multi-conductor, thermoset, Class 1E rated construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations and where flame retardancy and radiation resistance is critical
- Designed for use on circuits where overall shielding is required to protect from external electrostatic interference
- Can be installed in trays, conduit, ducts, or in direct burial applications

Features:

- Rated at 90 °C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- ICEA S-73-532

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ Instrumentation Cable

Multi-Conductor, Overall Shield



Class 1E Nuclear
600 V, 90°C, VW-1

Catalog Number	No. of Cond.	Cond. Size (AWG)	Cond. Strand	Minimum Avg. Insulation Thickness		Drain Wire Size (AWG)	Minimum Avg. Jacket Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
				Inches	mm		Inches	mm	Inches	mm	Lbs/1000 Ft	kg/km	Lb/1000 Ft	kg/km
22560.18.2	2	18	7/0152	0.025	0.64	20	0.045	1.14	0.295	7.49	13	19	48	71
22560.18.3	3	18	7/0152	0.025	0.64	20	0.045	1.14	0.309	7.85	18	27	56	83
22560.18.4	4	18	7/0152	0.025	0.64	20	0.045	1.14	0.332	8.43	23	34	79	117
22560.18.5	5	18	7/0152	0.025	0.64	20	0.045	1.14	0.399	10.10	29	43	85	126
22560.18.7	7	18	7/0152	0.025	0.64	20	0.045	1.14	0.428	10.90	39	58	106	158
22560.18.9	9	18	7/0152	0.025	0.64	20	0.045	1.14	0.488	12.40	49	73	132	196
22560.18.12	12	18	7/0152	0.025	0.64	20	0.045	1.14	0.557	14.10	64	95	164	244
22560.18.19	19	18	7/0152	0.025	0.64	20	0.060	1.52	0.654	16.60	99	147	257	382
22560.18.25	25	18	7/0152	0.025	0.64	20	0.060	1.52	0.747	18.90	130	193	327	487
22560.18.30	30	18	7/0152	0.025	0.64	20	0.060	1.52	0.793	20.10	155	231	377	561
22560.18.37	37	18	7/0152	0.025	0.64	20	0.080	2.03	0.890	22.60	191	284	449	668
22560.16.2	2	16	7/0192	0.025	0.64	18	0.045	1.14	0.319	8.10	21	31	61	91
22560.16.3	3	16	7/0192	0.025	0.64	18	0.045	1.14	0.335	8.51	29	43	73	108
22560.16.4	4	16	7/0192	0.025	0.64	18	0.045	1.14	0.365	9.27	37	55	89	132
22560.16.5	5	16	7/0192	0.025	0.64	18	0.045	1.14	0.433	11.00	46	68	109	162
22560.16.7	7	16	7/0192	0.025	0.64	18	0.045	1.14	0.465	11.80	62	94	137	204
22560.16.9	9	16	7/0192	0.025	0.64	18	0.060	1.52	0.561	14.20	78	116	170	253
22560.16.12	12	16	7/0192	0.025	0.64	18	0.060	1.52	0.620	15.70	103	153	235	349
22560.16.19	19	16	7/0192	0.025	0.64	18	0.060	1.52	0.711	18.10	159	237	337	501
22560.16.25	25	16	7/0192	0.025	0.64	18	0.060	1.52	0.791	20.10	202	300	406	604
22560.16.30	30	16	7/0192	0.025	0.64	18	0.080	2.03	0.904	23.00	249	371	542	806
22560.16.37	37	16	7/0192	0.025	0.64	18	0.080	2.03	0.967	24.60	305	454	643	957

Insulated conductor diameter (inches) 18 AWG (.10) and 16 AWG (.11).
Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Instrumentation Cable

Individually Shielded Pairs or Triads

Overall Shield

Class 1E Nuclear

600 V, 90°C, VW-1



SAFETY
RELATED



RADIATION-
RESISTANT



FLAME-
RETARDANT



MOISTURE
RESISTANT



UV/SUNLIGHT-
RESISTANT



CROSS-
LINKED



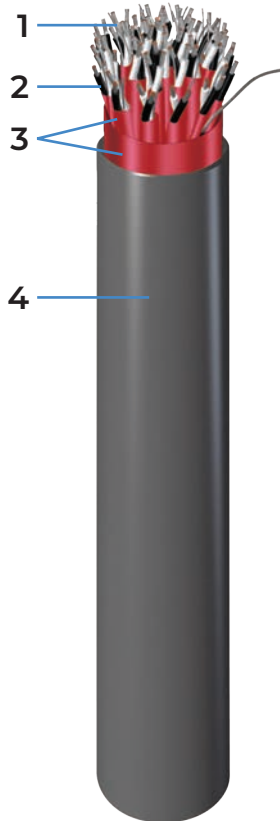
OIL-
RESISTANT



CUT-
THROUGH



COLD
BEND



Product Construction

1. Conductor:

- 18 AWG and 16 AWG tinned annealed copper per ASTM B33; Class B stranding per ASTM B8

2. Insulation:

- Flame-retardant, heat-, moisture- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Per ICEA Method 1 – Pairs: black and white; Triads: black, white and red. One conductor in each pair/triad is printed alpha-numerically for easy identification

3. Shields:

- Individually shielded: pairs or triads are 100% shielded with a copper/polyester tape in contact with a stranded tinned copper drain wire and an overall polyester electrical isolation tape
- Overall shield: copper/polyester tape in contact with a stranded tinned copper drain wire

4. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyolefin (XLPO)
- Color code: Black

Print:

- PRYSMIAN (WC) ULTROL® 60+ XX/ PR OR TRIADS XXAWG COPPER FR-XLPE XLPO SHIELDED 600V 90C SUN RES OIL RES I & II DIR BUR NUCLEAR DAY/MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Options:

- Conductor stranding
- ISO Metric conductor
- Tinned copper braid shield
- UL Type TC-ER (-ER for > 2 conductors) with 30 mil insulation wall thickness

Applications:

- ULTROL® 60+ instrumentation cable is a 600 V multi-conductor, thermoset, Class 1E rated construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations and where flame retardancy and radiation resistance is critical
- Designed for use on critical circuits where total isolation is required between pairs/ triads and from external interference
- Can be installed in trays, conduit, ducts, or in direct burial applications

Features:

- Rated at 90 °C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- ICEA S-73-532

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ Instrumentation Cable

Individually Shielded Pairs or Triads

Overall Shield



Class 1E Nuclear

600 V, 90°C, VW-1

Catalog Number	No. of Pairs/Triads	Cond. Size (AWG)	Cond. Strand	Minimum Avg. Insulation Thickness		Drain Wire Size (AWG)	Minimum Avg. Jacket Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
				Inches	mm		Inches	mm	Inches	mm	Lbs/1000 Ft	kg/km	Lb/1000 Ft	kg/km
25060.18.2P	2 SPS	18	7/0152	0.025	0.64	20	0.045	1.14	0.474	12.0	31	46	117	174
25060.18.3P	3 SPS	18	7/0152	0.025	0.64	20	0.045	1.14	0.490	12.5	43	64	173	257
25060.18.4P	4 SPS	18	7/0152	0.025	0.64	20	0.060	1.52	0.567	14.4	57	85	245	365
25060.18.5P	5 SPS	18	7/0152	0.025	0.64	20	0.060	1.52	0.619	15.7	70	104	290	432
25060.18.7P	7 SPS	18	7/0152	0.025	0.64	20	0.060	1.52	0.673	17.1	97	144	313	465
25060.18.9P	9 SPS	18	7/0152	0.025	0.64	20	0.060	1.52	0.784	19.9	125	186	389	579
25060.18.12P	12 SPS	18	7/0152	0.025	0.64	20	0.080	2.03	0.923	23.4	165	246	536	798
25060.18.19P	19 SPS	18	7/0152	0.025	0.64	20	0.080	2.03	1.077	27.4	259	385	708	1054
25060.16.2P	2 SPS	16	7/0192	0.025	0.64	18	0.045	1.14	0.519	13.2	47	70	142	211
25060.16.3P	3 SPS	16	7/0192	0.025	0.64	18	0.060	1.52	0.581	14.7	70	104	190	282
25060.16.4P	4 SPS	16	7/0192	0.025	0.64	18	0.060	1.52	0.635	16.1	89	132	223	332
25060.16.5P	5 SPS	16	7/0192	0.025	0.64	18	0.060	1.52	0.695	17.6	113	168	269	400
25060.16.7P	7 SPS	16	7/0192	0.025	0.64	18	0.060	1.52	0.757	19.2	154	229	348	518
25060.16.9P	9 SPS	16	7/0192	0.025	0.64	18	0.080	2.03	0.887	22.5	199	296	551	820
25060.16.12P	12 SPS	16	7/0192	0.025	0.64	18	0.080	2.03	0.996	25.3	264	393	694	1033
25060.16.19P	19 SPS	16	7/0192	0.025	0.64	18	0.080	2.03	1.164	29.6	414	616	935	1391
25060.18.2T	2 STS	18	7/0152	0.025	0.64	20	0.045	1.14	0.489	12.4	40	60	188	280
25060.18.3T	3 STS	18	7/0152	0.025	0.64	20	0.045	1.14	0.519	13.2	59	87	235	350
25060.18.4T	4 STS	18	7/0152	0.025	0.64	20	0.060	1.52	0.599	15.2	77	115	337	502
25060.18.5T	5 STS	18	7/0152	0.025	0.64	20	0.060	1.52	0.655	16.6	96	143	398	592
25060.18.7T	7 STS	18	7/0152	0.025	0.64	20	0.060	1.52	0.714	18.1	133	198	433	644
25060.18.9T	9 STS	18	7/0152	0.025	0.64	20	0.060	1.52	0.833	21.2	170	253	533	793
25060.18.12T	12 STS	18	7/0152	0.025	0.64	20	0.080	2.03	0.979	24.9	226	336	741	1102
25060.18.19T	19 STS	18	7/0152	0.025	0.64	20	0.080	2.03	1.145	29.1	356	530	977	1454
25060.16.2T	2 STS	16	7/0192	0.025	0.64	18	0.060	1.52	0.613	15.5	64	95	175	260
25060.16.3T	3 STS	16	7/0192	0.025	0.64	18	0.060	1.52	0.650	16.5	93	138	227	338
25060.16.4T	4 STS	16	7/0192	0.025	0.64	18	0.060	1.52	0.700	17.8	125	186	291	433
25060.16.5T	5 STS	16	7/0192	0.025	0.64	18	0.060	1.52	0.769	19.5	154	229	348	518
25060.16.7T	7 STS	16	7/0192	0.025	0.64	18	0.060	1.52	0.838	21.3	211	314	444	661
25060.16.9T	9 STS	16	7/0192	0.025	0.64	18	0.080	2.03	1.027	26.1	270	402	603	897
25060.16.12T	12 STS	16	7/0192	0.025	0.64	18	0.080	2.03	1.151	29.2	359	534	770	1146
25060.16.19T	19 STS	16	7/0192	0.025	0.64	18	0.080	2.03	1.351	34.3	566	842	1144	1702

Insulated conductor diameter (inches) 18 AWG (.10) and 16 AWG (.11).
Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Control Cable Multi-Conductor



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER*



SAFETY
RELATED



RADIATION-
RESISTANT



FLAME-
RETARDANT



MOISTURE
RESISTANT



UV/SUNLIGHT-
RESISTANT



CROSS-
LINKED



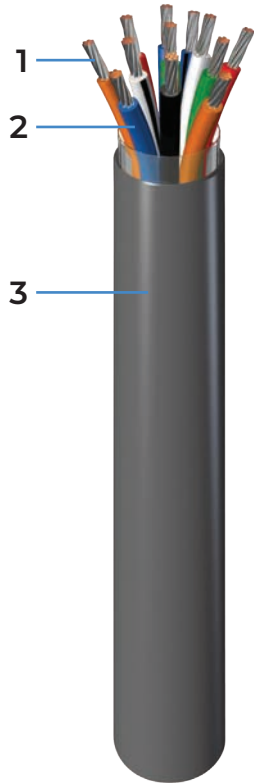
OIL-
RESISTANT



CUT-
THROUGH



COLD
BEND



Product Construction

1. Conductor:

- 14 AWG thru 10 AWG tinned annealed copper; Class B stranding; 2 thru 37 conductors

2. Insulation:

- Flame-retardant, heat-, moisture- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Per ICEA Method 1, Table E-1

3. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyolefin (XLPO)
- Color code: Black

Print:

- PRYSMIAN (WC) ULTROL® 60+ XX/C XXAWG COPPER FR-XLPE XLPO 600V 90C SUN RES OIL RES I & II DIR BUR (UL) TYPE-TC-ER* XHHW-2 VW-1 IEEE 1202/FT4 NUCLEAR DAY/MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

* -ER for > 2 conductors

Options:

- Conductor stranding
- ISO Metric conductor
- E-2 color code

Applications:

- ULTROL® 60+ instrumentation cable is a 600 V multi-conductor, thermoset, Class 1E rated construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations and where flame retardancy and radiation resistance is critical
- For use in Class 1E power distribution and control circuits for lighting and control systems
- Can be installed in trays, conduit, ducts, or in direct burial applications

Features:

- Rated at 90 °C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
 - ICEA S-73-532
 - UL 1277 Type TC-ER*
 - UL 44 XHHW-2
- * -ER for > 2 conductors

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ Control Cable

Multi-Conductor



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER*

Catalog Number	No. of Cond.	Cond. Size (AWG)	Cond. Strand	Minimum Avg. Insulation Thickness		Minimum Avg. Jacket Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
				Inches	mm	Inches	mm	Inches	mm	Lbs/ 1000 Ft	kg/km	Lb/ 1000 Ft	kg/km
27560.14.2	2	14	7/0235	0.030	0.76	0.045	1.14	0.366	9.30	24	36	75	111
27560.14.3	3	14	7/0235	0.030	0.76	0.045	1.14	0.385	9.78	36	54	92	137
27560.14.4	4	14	7/0235	0.030	0.76	0.045	1.14	0.420	10.60	48	71	113	168
27560.14.5	5	14	7/0235	0.030	0.76	0.045	1.14	0.459	11.60	61	91	136	202
27560.14.7	7	14	7/0235	0.030	0.76	0.045	1.14	0.499	12.60	85	126	176	262
27560.14.9	9	14	7/0235	0.030	0.76	0.060	1.52	0.613	15.50	109	162	243	361
27560.14.12	12	14	7/0235	0.030	0.76	0.060	1.52	0.675	17.10	155	231	339	504
27560.14.19	19	14	7/0235	0.030	0.76	0.060	1.52	0.785	19.90	245	365	536	797
27560.14.25	25	14	7/0235	0.030	0.76	0.080	2.03	0.951	24.20	321	478	661	984
27560.14.30	30	14	7/0235	0.030	0.76	0.080	2.03	1.013	25.70	385	573	836	1244
27560.14.37	37	14	7/0235	0.030	0.76	0.080	2.03	1.091	27.70	476	708	924	1375
27560.12.2	2	12	7/0297	0.030	0.76	0.045	1.14	0.402	10.20	39	58	96	143
27560.12.3	3	12	7/0297	0.030	0.76	0.045	1.14	0.420	10.70	61	91	129	192
27560.12.4	4	12	7/0297	0.030	0.76	0.045	1.14	0.460	11.70	81	121	182	271
27560.12.5	5	12	7/0297	0.030	0.76	0.045	1.14	0.503	12.80	102	152	216	322
27560.12.7	7	12	7/0297	0.030	0.76	0.060	1.52	0.585	14.90	135	200	259	385
27560.12.9	9	12	7/0297	0.030	0.76	0.060	1.52	0.671	17.00	184	274	379	564
27560.12.12	12	12	7/0297	0.030	0.76	0.060	1.52	0.754	19.20	245	365	479	713
27560.12.19	19	12	7/0297	0.030	0.76	0.080	2.03	0.923	23.40	389	579	738	1098
27560.12.25	25	12	7/0297	0.030	0.76	0.080	2.03	1.067	27.10	512	762	913	1358
27560.12.30	30	12	7/0297	0.030	0.76	0.080	2.03	1.138	28.90	613	912	1058	1574
27560.12.37	37	12	7/0297	0.030	0.76	0.080	2.03	1.227	31.20	756	1125	1274	1896
27560.10.2	2	10	7/0374	0.030	0.76	0.045	1.14	0.450	11.40	62	92	126	187
27560.10.3	3	10	7/0374	0.030	0.76	0.045	1.14	0.476	12.10	93	138	169	251
27560.10.4	4	10	7/0374	0.030	0.76	0.060	1.52	0.554	14.10	122	181	230	342
27560.10.5	5	10	7/0374	0.030	0.76	0.060	1.52	0.595	15.10	162	241	324	482
27560.10.7	7	10	7/0374	0.030	0.76	0.060	1.52	0.648	16.50	227	338	388	577
27560.10.9	9	10	7/0374	0.030	0.76	0.060	1.52	0.754	19.20	292	435	550	818
27560.10.12	12	10	7/0374	0.030	0.76	0.080	2.03	0.890	22.60	390	580	684	1018
27560.10.19	19	10	7/0374	0.030	0.76	0.080	2.03	1.038	26.40	614	914	1014	1509

Insulated conductor diameter (inches) 14 AWG (.14), 12 AWG (.16) and 10 AWG (.18).
Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Control Cable

Multi-Conductor, Overall Shield



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER*



SAFETY
RELATED



RADIATION-
RESISTANT



FLAME-
RETARDANT



MOISTURE
RESISTANT



UV/SUNLIGHT-
RESISTANT



CROSS-
LINKED



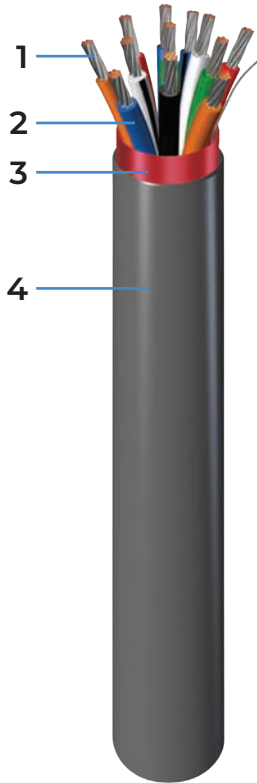
OIL-
RESISTANT



CUT-
THROUGH



COLD
BEND



Product Construction

1. Conductor:

- 14 AWG thru 10 AWG, tinned annealed copper; Class B stranding; 2 thru 37 conductors

2. Insulation:

- Flame-retardant, heat-, moisture- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Per ICEA Method 1, Table E-1

3. Overall Shield:

- Copper/polyester tape in contact with a stranded tinned copper drain wire

4. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyolefin (XLPO)
- Color code: Black

Print:

- PRYSMIAN (WC) ULTROL® 60+ XX/C XXAWG COPPER FR-XLPE SHIELDED 600V 90C SUN RES OIL RES I & II DIR BUR (UL) TYPE TC-ER* XHHW-2 VW-1 IEEE 1202/FT4 NUCLEAR DAY/MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

* -ER for > 2 conductors

Options:

- Conductor stranding
- ISO Metric conductor
- E-2 color code
- Longitudinal corrugated tinned copper tape shield

Applications:

- ULTROL® 60+ instrumentation cable is a 600 V multi-conductor, thermoset, Class 1E rated construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations and where flame retardancy and radiation resistance is critical
- Where optimum performance is required for use on Class 1E circuits when shielding from external electrostatic interference is required
- Can be installed in trays, conduit, ducts, or in direct burial applications

Features:

- Rated at 90 °C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
 - ICEA S-73-532
 - UL 1277 Type TC-ER*
 - UL 44 XHHW-2
- * -ER for > 2 conductors

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ Control Cable

Multi-Conductor, Overall Shield



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER*

Catalog Number	No. of Cond.	Cond. Size (AWG)	Cond. Strand	Minimum Avg. Insulation Thickness		Drain Wire Size (AWG)	Minimum Avg. Jacket Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
				Inches	mm		Inches	mm	Inches	mm	Lbs/ 1000 Ft	kg/km	Lb/ 1000 Ft	kg/km
30060.14.2	2	14	7/0235	0.030	0.76	16	0.045	1.14	0.365	9.27	33	49	85	126
30060.14.3	3	14	7/0235	0.030	0.76	16	0.045	1.14	0.379	9.63	47	69	108	161
30060.14.4	4	14	7/0235	0.030	0.76	16	0.045	1.14	0.414	10.50	59	88	134	199
30060.14.5	5	14	7/0235	0.030	0.76	16	0.045	1.14	0.512	13.00	72	108	152	227
30060.14.7	7	14	7/0235	0.030	0.76	16	0.060	1.52	0.582	14.80	98	146	211	313
30060.14.9	9	14	7/0235	0.030	0.76	16	0.060	1.52	0.663	16.80	124	185	289	430
30060.14.12	12	14	7/0235	0.030	0.76	16	0.060	1.52	0.736	18.70	163	243	352	524
30060.14.19	19	14	7/0235	0.030	0.76	16	0.080	2.03	0.888	22.60	251	374	546	812
30060.14.25	25	14	7/0235	0.030	0.76	16	0.080	2.03	1.014	25.80	330	491	675	1005
30060.14.30	30	14	7/0235	0.030	0.76	16	0.080	2.03	1.076	27.30	394	586	852	1268
30060.14.37	37	14	7/0235	0.030	0.76	16	0.080	2.03	1.154	29.30	484	720	1055	1570

30060.12.2	2	12	7/0305	0.030	0.76	14	0.045	1.14	0.397	10.00	54	80	129	192
30060.12.3	3	12	7/0305	0.030	0.76	14	0.045	1.14	0.420	10.70	74	110	145	216
30060.12.4	4	12	7/0305	0.030	0.76	14	0.045	1.14	0.460	11.70	94	140	198	295
30060.12.5	5	12	7/0305	0.030	0.76	14	0.060	1.52	0.607	15.40	115	171	229	341
30060.12.7	7	12	7/0305	0.030	0.76	14	0.060	1.52	0.653	16.60	156	232	305	453
30060.12.9	9	12	7/0305	0.030	0.76	14	0.060	1.52	0.745	18.90	197	293	394	587
30060.12.12	12	12	7/0305	0.030	0.76	14	0.060	1.52	0.828	21.00	258	384	495	736
30060.12.19	19	12	7/0305	0.030	0.76	14	0.080	2.03	0.997	25.30	401	597	754	1122
30060.12.25	25	12	7/0305	0.030	0.76	14	0.080	2.03	1.141	29.00	525	781	929	1383
30060.12.30	30	12	7/0305	0.030	0.76	14	0.080	2.03	1.211	30.80	626	932	1074	1599
30060.12.37	37	12	7/0305	0.030	0.76	14	0.080	2.03	1.301	33.10	769	1144	1291	1921

30060.10.2	2	10	7/0374	0.030	0.76	12	0.045	1.14	0.449	11.40	80	119	145	216
30060.10.3	3	10	7/0374	0.030	0.76	12	0.045	1.14	0.475	12.00	110	164	188	279
30060.10.4	4	10	7/0374	0.030	0.76	12	0.045	1.14	0.521	13.20	141	210	230	342
30060.10.5	5	10	7/0374	0.030	0.76	12	0.060	1.52	0.603	15.30	172	256	296	440
30060.10.7	7	10	7/0374	0.030	0.76	12	0.060	1.52	0.656	16.60	233	369	382	568
30060.10.9	9	10	7/0374	0.030	0.76	12	0.060	1.52	0.765	19.40	294	437	483	719
30060.10.12	12	10	7/0374	0.030	0.76	12	0.080	2.03	0.901	22.90	390	580	653	972
30060.10.19	19	10	7/0374	0.030	0.76	12	0.080	2.03	1.049	26.60	602	896	963	1433

Insulated conductor diameter (inches) 14 AWG (.14), 12 AWG (.16) and 10 AWG (.18). Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Power Cable

3 or 4 Conductors with Ground



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER



Product Construction

1. Conductor:

- 14 AWG thru 750 kcmil tinned annealed copper per ASTM B33; Class B stranding per ASTM B8

2. Insulation:

- Flame-retardant, heat-, moisture-, sunlight- and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyethylene (FR-XLPE)
- Color code: Per ICEA Method 1, Table E-1

3. Grounding Conductor:

- Tinned annealed copper Class B stranding, sized according to NEC® requirements

4. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyolefin (XLPO)
- Color code: Black

Print:

- PRYSMIAN (WC) ULTROL® 60+ XX/C XXAWG WITH GRND COPPER FRXLPE XLPO 600V 90C SUN RES OIL RES I & II DIR BUR (UL) TYPE TC-ER XHHW- 2 VW-1 IEEE 1202/FT4 NUCLEAR DAY/MONTH/YEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE

Options:

- Conductor stranding
- ISO Metric conductors
- Colored insulation
- Method 4 color code
- Sectioned grounding conductors
- Longitudinal corrugated tinned copper tape shield

Applications:

- ULTROL® 60+ power cable is a 600 V multi-conductor, thermoset, Class 1E rated construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations and where flame retardancy and radiation resistance is critical
- For use in Class 1E power distribution and control circuits for lighting, pumps, and utilization equipment
- Can be installed in trays, conduit, ducts, or in direct burial applications

Features:

- Rated at 90 °C wet or dry
- Fully traceable
- Qualified for 60-year service life
- Gamma and beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Excellent mechanical cut-through properties
- Long-term moisture and radiation stability
- Free stripping for ease of termination
- Meets cold bend test at -40°C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- ICEA S-95-658
- UL 1277 Type TC-ER
- UL 44 XHHW-2

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material to be shipped on non-returnable wooden reels



ULTROL® 60+ Power Cable

3 or 4 Conductors with Ground



Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER

Catalog Number	No. of Cond.	Cond. Size (AWG/kcmil)	Cond. Strand	Minimum Avg. Insulation Thickness		Ground Wire Size (AWG)	Minimum Avg. Jacket Thickness		Nominal Cable O.D.		Copper Weight		Net Weight	
				Inches	mm		Inches	mm	Inches	mm	Lbs/1000 Ft	kg/km	Lb/1000 Ft	kg/km
32560.14.3	3	14	7	0.030	0.76	14	0.045	1.14	0.385	9.8	52	77	103	153
32560.14.4	4	14	7	0.030	0.76	14	0.045	1.14	0.420	10.7	65	97	125	186
32560.12.3	3	12	7	0.030	0.76	12	0.045	1.14	0.425	10.8	82	122	140	208
32560.12.4	4	12	7	0.030	0.76	12	0.045	1.14	0.465	11.8	103	153	171	254
32560.10.3	3	10	7	0.030	0.76	10	0.045	1.14	0.475	12.1	131	195	198	295
32560.10.4	4	10	7	0.030	0.76	10	0.060	1.52	0.555	14.1	164	244	258	384
32560.8.3	3	8	7	0.045	1.14	10	0.060	1.52	0.640	16.3	187	278	314	467
32560.8.4	4	8	7	0.045	1.14	10	0.060	1.52	0.700	17.8	238	354	390	580
32560.6.3	3	6	7	0.045	1.14	8	0.060	1.52	0.715	18.2	297	442	451	671
32560.6.4	4	6	7	0.045	1.14	8	0.060	1.52	0.785	19.9	379	564	558	830
32560.4.3	3	4	7	0.045	1.14	8	0.060	1.52	0.825	21.0	442	658	628	935
32560.4.4	4	4	7	0.045	1.14	8	0.080	2.03	0.950	24.1	572	851	827	1231
32560.2.3	3	2	7	0.045	1.14	6	0.080	2.03	0.995	25.3	701	1043	958	1426
32560.2.4	4	2	7	0.045	1.14	6	0.080	2.03	1.090	27.7	908	1351	1207	1796
32560.1.3	3	1	19	0.055	1.40	6	0.080	2.03	1.120	28.4	861	1281	1203	1790
32560.1.4	4	1	19	0.055	1.40	6	0.080	2.03	1.235	31.4	1122	1670	1519	2261
32560.1/0.3	3	1/0	19	0.055	1.40	6	0.080	2.03	1.205	30.6	1081	1609	1413	2103
32560.1/0.4	4	1/0	19	0.055	1.40	6	0.080	2.03	1.330	33.8	1395	2076	1801	2680
32560.2/0.3	3	2/0	19	0.055	1.40	6	0.080	2.03	1.295	32.9	1323	1969	1704	2536
32560.2/0.4	4	2/0	19	0.055	1.40	6	0.080	2.03	1.425	36.2	1737	2585	2175	3237
32560.3/0.3	3	3/0	19	0.055	1.40	4	0.080	2.03	1.400	35.6	1694	2521	2118	3152
32560.3/0.4	4	3/0	19	0.055	1.40	4	0.080	2.03	1.550	39.4	2217	3299	2707	4028
32560.4/0.3	3	4/0	19	0.055	1.40	4	0.080	2.03	1.520	38.6	2102	3128	2577	3835
32560.4/0.4	4	4/0	19	0.055	1.40	4	0.110	2.79	1.740	44.2	2760	4107	3406	5069
32560.250.3	3	250	37	0.065	1.65	4	0.110	2.79	1.730	43.9	2460	3661	3159	4701
32560.250.4	4	250	37	0.065	1.65	4	0.110	2.79	1.910	48.5	3239	4820	4057	6037
32560.350.3	3	350	37	0.065	1.65	3	0.110	2.79	1.955	49.7	3437	5115	4157	6186
32560.350.4	4	350	37	0.065	1.65	3	0.110	2.79	2.160	54.9	4517	6722	5381	8008
32560.500.3	3	500	37	0.065	1.65	2	0.110	2.79	2.230	56.6	4866	7241	5737	8538
32560.500.4	4	500	37	0.065	1.65	2	0.110	2.79	2.470	62.7	6424	9560	7463	11106
32560.750.3	3	750	61	0.080	2.03	1	0.110	2.79	2.680	68.1	7249	10788	9014	13414
32560.750.4	4	750	61	0.080	2.03	1	0.140	3.56	3.040	77.2	9585	14264	11660	17352

Dimensions and weights are nominal; subject to industry tolerances.



ULTROL® 60+ Medium-Voltage Power Cable Shielded, Single Conductor



Class 1E Nuclear

5 kV and 8 kV, UL Type MV-105, 133%/100% Ins. Levels; 15 kV, UL Type MV-105, 133% Ins. Level



SAFETY
RELATED



RADIATION-
RESISTANT



FLAME-
RETARDANT



MOISTURE
RESISTANT



UV/SUNLIGHT-
RESISTANT



CROSS-
LINKED



OIL-
RESISTANT



CUT-
THROUGH



COLD
BEND



Product Construction

1. Conductor:

- 5 kV (133%) and 8 kV (100%): 6 AWG thru 1000 kcmil annealed tinned copper compressed Class B strand
- 15 kV (133%): 2 AWG thru 1000 kcmil annealed tinned copper compressed Class B strand

2. Extruded Strand Shield (ESS):

- Extruded thermoset semi-conducting stress-control layer over conductor

3. Insulation:

- Radiation-resistant Ethylene Propylene Rubber (EPR) insulation, colored to contrast with the black semi-conducting shield layers

4. Extruded Insulation Shield (EIS):

- Thermoset semi-conducting polymeric layer free stripping from insulation

5. Metallic Shield:

- Longitudinally applied 8 mil corrugated tinned copper tape with overlap

6. Jacket:

- Flame-retardant, moisture-, oil-, sunlight and radiation-resistant, thermoset ULTROL® 60+ Cross-linked Polyolefin (XLPO)
- Color code: Black

Print:

- PRYSMIAN (PLANT OF MFG) DAY MONTH YEAR LIGHTNING BOLT SYMBOL ULTROL® 60+ 1/C SIZE (AWG OR KCMIL) CU (INSULATION THICKNESS) EPR TYPE MV-105 (VOLTAGE) KV % INSULATION LEVEL SUN RES FOR CT USE* (UL) NUCLEAR TRACEABILITY NUMBER SEQUENTIAL FOOTAGE
- *Note - Sizes 1/0AWG and larger include: FOR CT USE

Applications:

- Superior performance in utility power generating plants and other industrial three-phase applications
- For power to emergency diesel motors
- Class 1E rated wire construction specifically designed for safety-related or non-safety-related applications in nuclear generating stations
- For use in wet or dry locations
- For use in aerial, conduit, open tray, underground duct installations, and direct burial

Features:

- UL Rated 105 °C
- ICEA Rated at 90 °C wet or dry
- Qualified for 60-year service life
- Fully traceable
- Gamma and Beta radiation resistant (up to 350 megarads)
- Submergence operability
- Long-term thermal endurance and superior electricals
- Long-term moisture and radiation stability
- Excellent heat and moisture resistance
- Outstanding corona resistance
- Flexibility for easy handling
- High dielectric strength
- Low moisture absorption
- Electrical stability under stress
- Low dielectric loss
- Chemical-resistant
- Meets cold bend test at -25 °C

Industry Compliances:

- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003/2015
- UL 1072
- ICEA S-93-639/NEMA WC74
- ICEA S-97-682
- AEIC CS8-07
- UL listed as Type MV-105 for use in accordance with NEC, UL File # E90501
- Sizes 1/0 AWG and larger are listed and marked "FOR CT USE" in accordance with NEC

Flame Test Compliances:

- IEEE 383:1974
- IEEE 383:2003
- ICEA T-29-520
- IEEE 1202/FT4-1991, Aged & Unaged
- VW-1

Other:

- Quality assurance program in accordance with NRC 10CFR50 Appendix B
- ANSI N45.2
- ASME NQA-1
- NIAC
- NUPIC

Packaging:

- Material cut to length and shipped on non-returnable wood reels.
- Extra charges apply for cuts less than 1000 ft., lagging, pulling eyes, paralleling and triplexing



ULTROL® 60+ Medium-Voltage Power Cable Shielded, Single Conductor



Class 1E Nuclear

5 kV and 8 kV, UL Type MV-105, 133%/100% Ins. Levels; 15 kV, UL Type MV-105, 133% Ins. Level

Voltage	Siz Range (AWG/kcmil)	Insulation Thickness (mils)
5 KV (133%), 8 KV (100%)	6 thru 1000	115
15 KV (133%)	2 thru 1000	220



Common Color Sequence

Method 1 - Table E1 Color Sequence

Cond. No.	Background Or Base Color	First Tracer Color	Second Tracer Color	Cond. No.	Background Or Base Color	First Tracer Color	Second Tracer Color
1	Black	-	-	20	Red	Green	-
2	White	-	-	21	Orange	Green	-
3	Red	-	-	22	Black	White	Red
4	Green	-	-	23	White	Black	Red
5	Orange	-	-	24	Red	Black	White
6	Blue	-	-	25	Green	Black	White
7	White	Black	-	26	Orange	Black	White
8	Red	Black	-	27	Blue	Black	White
9	Green	Black	-	28	Black	Red	Green
10	Orange	Black	-	29	White	Red	Green
11	Blue	Black	-	30	Red	Black	Green
12	Black	White	-	31	Green	Black	Orange
13	Red	White	-	32	Orange	Black	Green
14	Green	White	-	33	Blue	White	Orange
15	Blue	White	-	34	Black	White	Orange
16	Black	Red	-	35	White	Red	Orange
17	White	Red	-	36	Orange	White	Blue
18	Orange	Red	-	37	White	Red	Blue
19	Blue	Red	-				

Pair cables are Black, White and numbered. Triad cables are Black, White, Red and numbered.

Method 4 - All Conductors Black

Cond.	Conductor Printing
1st	"1-One"
2nd	"2-Two"
3rd	"3-Three"
4th	"4-Four"
5th	"5-Five"

Method 1 - Table E2 Color Sequence

Cond. No.	Background Or Base Color	Tracer Color	Cond. No.	Background Or Base Color	Tracer Color
1	Black	-	19	Orange	Blue
2	Red	-	20	Yellow	Blue
3	Blue	-	21	Brown	Blue
4	Orange	-	22	Black	Orange
5	Yellow	-	23	Red	Orange
6	Brown	-	24	Blue	Orange
7	Red	Black	25	Yellow	Orange
8	Blue	Black	26	Brown	Orange
9	Orange	Black	27	Black	Yellow
10	Yellow	Black	28	Red	Yellow
11	Brown	Black	29	Blue	Yellow
12	Black	Red	30	Orange	Yellow
13	Blue	Red	31	Brown	Yellow
14	Orange	Red	32	Black	Brown
15	Yellow	Red	33	Red	Brown
16	Brown	Red	34	Blue	Brown
17	Black	Blue	35	Orange	Brown
18	Red	Blue	36	Yellow	Brown

Pair cables are Black, Red and numbered. Triad cables are Black, Red, Blue and numbered. Colors repeat after 36 conductors. There are no Green or White conductors or stripes.

ANSI MC 96.1 Conductor Alloy and Color Code

Cond. Type	Positive Wire		Negative Wire		Outer Jacket
	Alloy	Color	Alloy	Color	
EX	Chromel	Purple	Constantan	Red	Purple
JX	Iron	White	Constantan	Red	Black
KX	Chromel	Yellow	Alumel	Red	Yellow
TX	Copper	Blue	Constantan	Red	Blue

Temperature Conversion Table

Known temperature is in boldface type - **Temp (°F or °C)**. Corresponding temperature in degrees Fahrenheit will be found in the column to the right. Corresponding temperature in degrees Centigrade will be found in the column to the left.

-5 to -100			0 to 100						100 to 500		
°C	Temp (°F or °C)	°F	°C	Temp (°F or °C)	°F	°C	Temp (°F or °C)	°F	°C	Temp (°F or °C)	°F
-73.3	-100	-148	-17.8	0	32.0	10.0	50	122.0	38	100	212
-70.5	-95	-139	-17.2	1	33.8	10.6	51	123.8	43	110	230
-67.8	-90	-130	-16.7	2	35.6	11.1	52	125.6	49	120	248
-65.0	-85	-121	-16.1	3	37.4	11.7	53	127.4	54	130	266
-62.2	-80	-112	-15.6	4	39.2	12.2	54	129.2	60	140	284
-59.5	-75	-103	-15.0	5	41.0	12.8	55	131.0	66	150	302
-56.7	-70	-94	-14.4	6	42.8	13.3	56	132.8	71	160	320
-53.9	-65	-85	-13.9	7	44.6	13.9	57	134.6	77	170	338
-51.1	-60	-76	-13.3	8	46.4	14.4	58	136.4	82	180	356
-48.3	-55	-67	-12.8	9	48.2	15.0	59	138.2	88	190	374
-45.6	-50	-58	-12.2	10	50.0	15.6	60	140.0	93	200	392
-42.8	-45	-49	-11.7	11	51.8	16.1	61	141.8	99	210	410
-40.0	-40	-40	-11.1	12	53.6	16.7	62	143.6	100	212	413
-37.2	-35	-31	-10.6	13	55.4	17.2	63	145.4	104	220	428
-34.4	-30	-22	-10.0	14	57.2	17.8	64	147.2	110	230	446
-31.6	-25	-13	-9.44	15	59.0	18.3	65	149.0	116	240	464
-28.9	-20	-4	-8.89	16	60.8	18.9	66	150.8	121	250	482
-26.1	-15	5	-8.33	17	62.6	19.4	67	152.6	127	260	500
-23.3	-10	14	-7.78	18	64.4	20.0	68	154.4	132	270	518
-20.5	-5	23	-7.22	19	66.2	20.6	69	156.2	138	280	536
			-6.67	20	68.0	21.1	70	158.0	143	290	554
			-6.11	21	69.8	21.7	71	159.8	149	300	572
			-5.56	22	71.6	22.2	72	161.6	154	310	590
			-5.00	23	73.4	22.8	73	163.4	160	320	608
			-4.44	24	75.2	23.3	74	165.2	166	330	626
			-3.89	25	77.0	23.9	75	167.0	171	340	644
			-3.33	26	78.8	24.4	76	168.8	177	350	662
			-2.78	27	80.6	25.0	77	170.6	182	360	680
			-2.22	28	82.4	25.6	78	172.4	188	370	698
			-1.67	29	84.2	26.1	79	174.2	193	380	716
			-1.11	30	86.0	26.7	80	176.0	199	390	734
			-0.56	31	87.7	27.2	81	177.8	204	400	752
			0	32	89.6	27.8	82	179.6	210	410	770
			0.56	33	91.4	28.3	83	181.4	216	420	788
			1.11	34	93.2	28.9	84	183.2	221	430	806
			1.67	35	95.0	29.4	85	185.0	227	440	824
			2.22	36	96.8	30.0	86	186.8	232	450	842
			2.78	37	98.6	30.6	87	188.6	238	460	860
			3.33	38	100.4	31.1	88	190.4	243	470	878
			3.89	39	102.2	31.7	89	192.2	249	480	896
			4.44	40	104.0	32.2	90	194.0	254	490	914
			5.00	41	105.8	32.8	91	195.8	260	500	932
			5.56	42	107.6	33.3	92	197.6			
			6.11	43	109.4	33.9	93	199.4			
			6.67	44	111.2	34.4	94	201.2			
			7.22	45	113.0	35.0	95	203.0			
			7.78	46	114.8	35.6	96	204.8			
			8.33	47	116.6	36.1	97	206.6			
			8.89	48	118.4	36.7	98	208.4			
			9.44	49	120.2	37.2	99	210.2			
						37.8	100	212.0			

Interpolation Factors

°C	Temp (°F or °C)	°F	°C	Temp (°F or °C)	°F	°C	Temp (°F or °C)	°F
0.56	1	1.8	2.22	4	7.2	3.89	7	12.6
1.11	2	3.6	2.78	5	9.0	4.44	8	14.4
1.67	3	5.4	3.33	6	10.8	5.00	9	16.2

Metric Conversion Factors

	To Convert From	To	Multiply By
Length	Inches	Millimeters	25.4
	Millimeters	Inches	0.03937
	Inches	Centimeters	2.54
	Centimeters	Inches	0.3937
	Feet	Meters	0.3048
	Meters	Feet	3.2808
Area	Kilofeet (1000 feet)	Kilometers	0.3048
	Kilometers	Kilofeet (1000 feet)	3.2808
	Square Inches	Square Millimeters	645.16
	Square Millimeters	Square Inches	0.00155
	Square Inches	Square Centimeters	6.4516
	Square Centimeters	Square Inches	0.155
Weight	Square Inches	Circular Mils	1,273,240
	Circular Mils	Square Inches	7.854×10^{-7}
	Circular Mils	Kilometers	5.066×10^4
	Kilometers	Circular Mils	1973.51
	Square Feet	Square Meters	0.0929
	Square Meters	Square Feet	10.764
Electrical	Pounds	Kilograms	0.4536
	Kilograms	Pounds	2.2046
	Pound/Kilofeet	Kilograms/Kilometer	1.4882
	Kilograms/Kilometer	Pound/Kilofeet	0.6720
	Ohms/Kilofeet	Ohms/Kilometer	3.2808
	Ohms/Kilometer	Ohms/Kilofeet	0.3048
Mechanical	Microfarads/Kilofeet	Microfarads/Kilometer	3.2808
	Microfarads/Kilometer	Microfarads/Kilofeet	0.3048
	Insulation Resistance:		
	Megohms – Kilofeet	Megohms – Kilometer	0.3048
	Megohms – Kilometer	Megohms – Kilofeet	3.2808
	Pounds/Square Inch	Kilo Pascal*	6.895
Electrical	Kilo Pascal*	Pounds/Square Inch	0.1432
	Pounds (force)	Newtons	4.448

* 1 Pascal = 1 Newton/square meters

AWG (American Wire Gauge) to mm² (Millimeters Squared) Conversion

AWG to mm ² CONVERSION TABLE	
AWG/kcmil	[mm ²] *
20	0.52
18	0.82
16	1.31
14	2.08
12	3.31
10	5.26
8	8.36
6	13.3
4	21.2
2	33.6
1	42.4
1/0	53.5
2/0	67.4
3/0	85.0
4/0	107
250	127
300	152
350	177
400	203
450	228
500	253
600	304
750	380
800	405
1000	507

* Equivalent mm² cross-sectional area

mm ² to AWG CONVERSION TABLE		
mm ²	[mm ²] *	AWG/kcmil
0.5	0.52	20
0.75	0.82	18
1.5	1.31	16
2.5	2.08	14
2.5	3.31	12
4	3.31	12
6	5.26	10
10	8.36	8
16	13.3	6
25	21.2	4
35	33.6	2
35	42.4	1
50	53.5	1/0
70	67.4	2/0
95	85.0	3/0
95	107	4/0
120	107	4/0
120	127	250
150	152	300
185	177	350
185	203	400
240	228	450
240	253	500
300	304	600
400	380	750
400	405	800
500	507	1000

Multiple AWG choices — consult responsible engineer for required ampacity

* Equivalent mm² cross-sectional area

Class B Conductors for General Wiring



Copper Conductor

ASTM CLASS B

Cond. Size	Stranding	Nominal Area		Nominal Weight		Concentric		Compressed		Compact	
						Nominal O.D.		Nominal O.D.		Nominal O.D.	
AWG/Kcmil	Inches	Circular Mils	mm²	Lbs/1000 Ft¹	kg/km	Inches	mm	Inches	mm	Inches	mm
22	7/.0096	640	0.32	1.99	2.96	0.029	0.74	—	—	—	—
20	7/.0121	1,020	0.52	3.15	4.69	0.036	0.91	—	—	—	—
18	7/.0152	1,620	0.82	5.10	7.59	0.046	1.17	—	—	—	—
16	7/.0192	2,580	1.31	7.74	11.52	0.058	1.47	—	—	—	—
14	7/.0242	4,110	2.08	12.70	18.90	0.073	1.84	0.071	1.80	—	—
12	7/.0305	6,530	3.31	20.20	30.10	0.092	2.32	0.089	2.26	—	—
10	7/.0385	10,380	5.26	32.10	47.80	0.116	2.95	0.113	2.87	—	—
8	7/.0486	16,510	8.36	51	75.90	0.146	3.71	0.142	3.60	0.134	3.40
6	7/.0612	26,240	13.30	81.10	120.70	0.184	4.67	0.178	4.53	0.169	4.29
4	7/.0772	41,740	21.20	129	192	0.232	5.89	0.225	5.72	0.213	5.41
2	7/.0974	66,360	33.60	205	305.10	0.292	7.42	0.283	7.19	0.268	6.81
1	19/.0664	83,690	42.40	258	383.90	0.332	8.43	0.322	8.18	0.299	7.59
1/0	19/.0745	105,600	53.50	326	485.10	0.373	9.47	0.362	9.19	0.336	8.53
2/0	19/.0837	133,100	67.40	411	611.60	0.419	10.64	0.406	10.32	0.376	9.55
3/0	19/.0940	167,800	85	518	770.90	0.470	11.94	0.456	11.58	0.423	10.74
4/0	19/.1055	211,600	107	653	971.80	0.528	13.41	0.512	13.01	0.475	12.07
250	37/.0822	250,000	127	772	1148.90	0.575	14.61	0.558	14.17	0.520	13.21
300	37/.0900	300,000	152	926	1378	0.630	16.00	0.611	15.52	0.570	14.48
350	37/.0973	350,000	177	1,081	1609	0.681	17.30	0.661	16.78	0.616	15.65
400	37/.1040	400,000	203	1,235	1838	0.728	18.49	0.706	17.94	0.659	16.74
500	37/.1162	500,000	253	1,544	2298	0.813	20.65	0.789	20.03	0.736	18.69
600	61/.0992	600,000	304	1,883	2802	0.893	22.68	0.866	22.00	0.813	20.65
750	61/.1109	750,000	380	2,316	3447	0.998	25.35	0.968	24.59	0.908	23.06
1000	61/.1280	1,000,000	507	3,088	4595	1.152	29.26	1.117	28.38	1.060	26.92

Dimensions and weights are nominal; subject to industry tolerances.
 ¹ Nominal conductor weights are applicable for Concentric Class B and Compressed Stranding per ASTM B8.



Class C Conductors for General Wiring



Copper Conductor

ASTM CLASS C

Size	Stranding	Nominal Area		Nominal Diameter		Nominal Weight	
AWG/kcmil	Inches	Circular Mils	mm²	Inches	mm	Lbs/kft	kg/km
22	19/.0063	640	0.32	0.031	0.79	2.34	3.48
20	19/.0080	1,020	0.52	0.038	0.97	3.71	5.52
18	19/.0092	1,620	0.82	0.044	1.12	5.00	7.40
16	19/.0117	2,580	1.31	0.056	1.42	7.97	11.86
14	19/.0147	4,110	2.08	0.070	1.80	12.70	18.90
12	19/.0185	6,530	3.31	0.089	2.24	20.20	30.10
10	19/.0234	10,380	5.26	0.112	2.85	32.05	47.80
9	19/.0262	13,090	6.63	0.126	3.20	40.40	60.10
8	19/.0295	16,510	8.37	0.143	3.63	51.00	74.40
7	19/.0331	20,820	10.50	0.162	4.11	64.30	95.70
6	19/.0372	26,240	13.30	0.184	4.67	81.00	121
5	19/.0417	33,090	16.80	0.203	5.16	102	152
4	19/.0469	41,740	21.20	0.235	5.97	129	192
3	19/.0526	52,620	26.70	0.263	6.68	163	243
2	19/.0591	66,360	33.60	0.296	7.52	205	305
1	37/.0476	83,690	42.40	0.323	8.20	258	384
1/0	37/.0534	105,600	53.50	0.362	9.20	326	485
2/0	37/.0600	133,100	67.40	0.407	10.33	411	612
3/0	37/.0673	167,800	85	0.457	11.60	518	771
4/0	37/.0756	211,600	107	0.513	13.03	653	972
250	31/.0640	250,000	127	0.558	14.17	774	1150
262.6	—	—	—	—	—	—	—
300	61/.0701	300,000	152	0.612	15.54	927	1380
313.1	—	—	—	—	—	—	—
350	61/.0757	350,000	177	0.661	16.79	1082	1610
373.7	—	—	—	—	—	—	—
400	61/.0810	400,000	203	0.711	18.10	1235	1838
444.4	—	—	—	—	—	—	—
500	61/.0905	500,000	253	0.791	20.10	1545	2299
535.3	—	—	—	—	—	—	—
592	—	—	—	—	—	—	—
600	91/.0812	600,000	304	0.893	22.70	1853	2757
646.4	—	—	—	—	—	—	—
750	91/.0908	750,000	380	0.999	25.40	2316	3446
777.7	—	—	—	—	—	—	—
1000	91/.1048	1,000,000	507	1.153	29.30	3088	4595
1111	—	—	—	—	—	—	—

Dimensions and weights are nominal; subject to industry tolerances.



Class H Conductors for General Wiring



Copper Conductor

ASTM CLASS H

Size	Stranding	Nominal Area		Nominal Diameter		Nominal Weight	
AWG/kcmil	Inches	Circular Mils	mm²	Inches	mm	Lbs/kft	kg/km
9	—	—	—	—	—	—	—
8	133/.0111	16,510	8.37	0.164	4.17	52	77
7	133/.0126	20,820	10.50	0.190	4.83	67	100
6	133/.0140	26,240	13.30	0.204	5.18	82	122
5	133/.0158	33,090	16.80	0.231	5.87	105	156
4	133/.0177	41,740	21.20	0.260	6.60	132	196
3	133/.0199	52,620	26.70	0.292	7.42	167	248
2	133/.0223	66,360	33.60	0.327	8.31	208	310
1	259/.0180	83,690	42.40	0.363	9.22	266	396
1/0	259/.0202	105,600	53.50	0.407	10.30	334	497
2/0	259/.0227	133,100	67.40	0.458	11.60	422	628
3/0	259/.0255	167,800	85	0.515	13.10	533	793
4/0	259/.0286	211,600	107	0.579	14.70	670	997
250	427/.0242	250,000	127	0.627	15.90	795	1183
262.6	—	—	—	—	—	—	—
300	427/.0265	300,000	152	0.702	17.80	953	1418
313.1	—	—	—	—	—	—	—
350	427/.0286	350,000	177	0.740	18.80	1110	1652
373.7	—	—	—	—	—	—	—
400	427/.0306	400,000	203	0.809	20.50	1270	1890
444.4	—	—	—	—	—	—	—
500	427/.0342	500,000	253	0.900	22.90	1590	2366
535.3	—	—	—	—	—	—	—
592	—	—	—	—	—	—	—
600	703/.0292	600,000	304	1.022	26.00	1920	2857
646.4	—	—	—	—	—	—	—
750	703/.0327	750,000	380	1.122	28.50	2410	3586
777.7	—	—	—	—	—	—	—
1000	703/.0377	1,000,000	507	1.294	32.90	3205	4769
1111	—	—	—	—	—	—	—

Dimensions and weights are nominal; subject to industry tolerances.



Class I Conductors for General Wiring



Copper Conductor

ASTM CLASS I

Size	Stranding	Nominal Area		Nominal Diameter		Nominal Weight	
AWG/kcmil	Inches	Circular Mils	mm²	Inches	mm	Lbs/kft	kg/km
10	27/.0201	10,910	5.53	0.117	2.97	33.70	50
9	—	—	—	—	—	—	—
8	37/.0201	14,950	7.57	0.135	3.43	46	68
7	—	—	—	—	—	—	—
6	61/.0201	24,640	12.50	0.174	4.42	77	114
5	91/.0201	36,760	19	0.242	6.15	116	173
4	105/.0201	42,420	21	0.262	6.60	137	204
3	126/.0201	50,500	25	0.285	7.24	167	249
2	147/.0201	60,600	31	0.307	7.80	190	283
1	224/.0201	90,900	46	0.380	9.65	287	427
1/0	273/.0201	111,100	56	0.410	10.41	351	522
2/0	323/.0201	131,300	66	0.470	11.90	407	606
3/0	456/.0201	184,200	92	0.549	13.94	594	884
4/0	551/.0201	222,600	112	0.593	14.70	696	1035
250	—	—	—	—	—	—	—
262.6	646/.0201	261,000	133	0.630	16	820	1220
300	—	—	—	—	—	—	—
313.1	777/.0201	313,900	159	0.685	17.40	987	1469
350	—	—	—	—	—	—	—
373.7	925/.0201	373,700	189	0.750	19	1176	1750
400	—	—	—	—	—	—	—
444.4	1110/.0201	448,400	225	0.820	20.80	1413	2103
500	—	—	—	—	—	—	—
535.3	1332/.0201	538,100	271	0.895	22.70	1697	2525
592	1480/.0201	597,900	303	0.972	24.70	1858	2765
600	—	—	—	—	—	—	—
646.4	1591/.0201	642,800	327	0.980	24.90	2020	3006
750	—	—	—	—	—	—	—
777.7	1924/.0201	777,700	394	1.075	27.30	2435	3624
1000	—	—	—	—	—	—	—
1111	2745/.0201	1,111,000	563	1.328	33.70	3400	5059

Dimensions and weights are nominal; subject to industry tolerances.



Class K Conductors for General Wiring



Copper Conductor

ASTM CLASS K

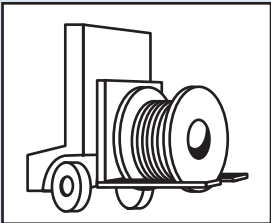
Size	Stranding	Nominal Area		Nominal Diameter		Nominal Weight	
AWG/kcmil	Inches	Circular Mils	mm²	Inches	mm	Lbs/kft	kg/km
22	—	—	—	—	—	—	—
20	10/.010	1,020	0.52	0.036	0.91	3.2	4.8
18	16/.010	1,620	0.82	0.046	1.20	5	7.4
16	26/.010	2,580	1.31	0.057	1.40	7.97	12
14	41/.010	4,110	2.08	0.071	1.80	12.8	19
12	65/.010	6,530	3.31	0.088	2.20	20.3	30.2
10	105/.010	10,380	5.26	0.112	2.80	33.3	49.6
9	133/.010	13,090	6.63	0.150	3.80	42.4	63.1
8	168/.010	16,510	8.37	0.164	4	53.2	80.8
7	210/.010	20,820	10.50	0.175	4.40	66.8	99.4
6	266/.010	26,240	13.30	0.198	5.00	84.2	125
5	336/.010	33,090	16.80	0.261	6.60	106	158
4	420/.010	41,740	21.20	0.249	6.30	132	196
3	532/.010	52,620	26.70	0.298	7.60	169	251
2	665/.010	66,360	33.60	0.317	8.10	211	314
1	836/.010	83,690	42.40	0.356	9	266	396
1/0	1064/.010	105,600	53.50	0.401	10	338	503
2/0	1323/.010	133,100	67.40	0.501	13	425	632
3/0	1666/.010	167,800	85	0.562	14	535	796
4/0	2107/.010	211,600	107	0.627	15.93	676	1006
250	2499/.010	250,000	127	0.688	17	802	1193
262.6	2220/.010	222,000	112	0.680	17	824	1226
300	2989/.010	300,000	152	0.753	19	960	1428
313.1	3136/.010	313,600	159	0.750	19	969	1442
350	3458/.010	350,000	177	0.818	21	1120	1667
373.7	3737/.010	373,700	189	0.790	20	1210	1800
400	3990/.010	400,000	203	0.878	22	1290	1920
444.4	—	—	—	—	—	—	—
500	5054/.010	500,000	253	0.990	25	1635	2433
535.3	5320/.010	532,000	270	0.950	24	1641	2442
592	—	—	—	—	—	—	—
600	5985/.010	600,000	340	1.125	29	1950	2902
646.4	6466/.010	646,600	328	1.040	26	1987	2957
750	7448/.010	750,000	380	1.276	32	2427	3611
777.7	—	—	—	—	—	—	—
1000	9975/.010	1,000,000	507	1.498	38	3250	4769
1111	—	—	—	—	—	—	—

Dimensions and weights are nominal; subject to industry tolerances.

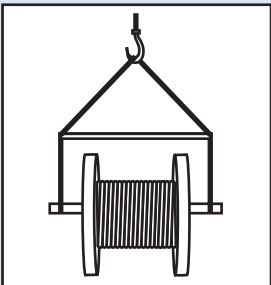


How to Handle Cable Reels

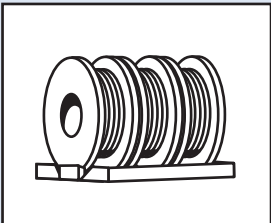
YES



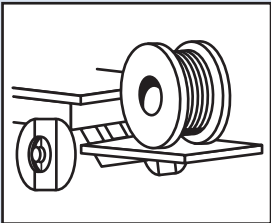
Cradle both reel flanges between forks.



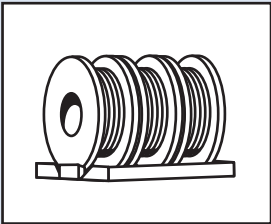
Reels can be hoisted with a shaft extended through both flanges.



Always load with flanges on edge and chock and block securely.

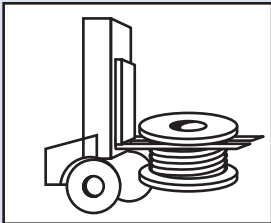


Lower reels from truck using hydraulic gate, hoist or fork lift. LOWER CAREFULLY.

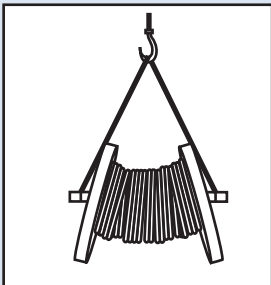


Always load with flanges on edge and chock and block securely.

NO



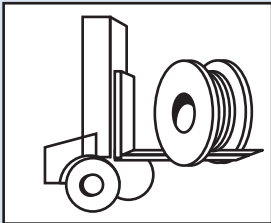
Do not lift by top flange. Cable or reel will be damaged.



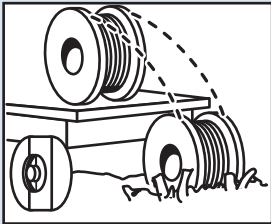
Use a spreader bar to prevent bending the reel flanges and mashing the cable.



Upended heavy reels will often arrive damaged. Refuse or receive subject to inspection for hidden damage.



Never allow forks to touch cable surface or reel wrap.



Never drop reels.

Recommended Reel Handling Practices

Unloading and Moving of Reels:

Cable reels are never shipped upended (flat side down). Cable reels that arrive in this manner should be rejected or received only after a thorough inspection for damage.

See “Recommended Reel Handling Practices” page.

Upon receipt, a cable's protective covering and/or lagging should be inspected for evidence of damage during shipment. If evidence of damage is found, a report should immediately be made to the carrier.

Under no circumstances should reels be dropped from the delivering vehicle to the ground.

Unloading and reel handling should be accomplished so that the equipment used does not contact the cable surface, and in the case of protective wrap, that the equipment does not contact the protective wrap.

If unloading and reel handling is accomplished by crane, either a cradle supporting the reel flanges or a shaft through the arbor hole should be used. If a fork lift is utilized, the forks must lift the reel at 90° to the flanges and the forks must be long enough to make complete lifting contact with both flanges. Under no circumstances should the forks come into contact with the cable surface or the protective wraps.

When a reel of cable is rolled from one point to another, care must be taken to see that there are no objects on the surface area which could contact or damage the cable surface or protective wrap.

If an inclined ramp is used for unloading, the ramp must be wide enough to contact both flanges completely. The stopping of the reels at the bottom shall be accomplished by using the reel flanges and not the surface of the cable.

Minimum Drum Diameters for Packaging Cables	
Type of Cable	Minimum Drum Diameter as a Multiple of Outside Diameter of Cable
1. Single and multiple conductor cable - unshielded 0-2000 V	10
2. Single and multiple conductor cable - unshielded 2400 V	12
3. Single and multiple conductor cable - wire shield (UniShield®) 5-35 kV	12
4. Single and multiple conductor cable - helically applied tape shield (Uniblend®) 5-35 kV	14
5. Single and multiple conductor cable - longitudinally applied flat tape shield (Type TC)	20
6. Single and multiple conductor cable - Interlocked Armor (Duralox®) 600 V-35 kV	14
7. Triplexed single conductors cabled together. The circumscribing overall diameter* shall be multiplied by the factor in 1 - 6 and then by the reduction factor.	.75

*Single conductor times 2.155 times
NEMA WC26 EEMAC201-2007 Binational Wire and Cable Packaging Standard

Recommended Reel Storage Practices

Storage and Storage Maintenance:

Finished cables have no established shelf-life. Moisture and atmospheric conditions can cause exposed conductors to oxidize and discolor. Uncovered/unsheltered cable will degrade due to exposure to direct sunlight and/or the elements. If the cables are protected, there should be no degradation of the insulation.

In general, any cable for use indoors should be stored indoors. Any cable suitable for installation outdoors is suitable for storage outdoors. Cables stored outdoors should have the ends sealed to prevent moisture ingress into the cable and should be used within two years or less.

Cables should be stored in a sheltered area. The cable conductor should not be exposed to water.

Cables with a cold temperature marking, e.g. -10°C , -25°C , or -40°C , may be stored outdoors. Cables without a cold temperature marking must be stored indoors.

Cable reels must remain in the upright position. Cable reels must not be stored on their sides. Reels must not be stacked.

Cable reels should be stored with the protective covering or lagging in place. If a length of cable has been cut from the reel, the cable end should be immediately resealed to prevent the entrance of moisture. If a part length is returned to storage, the reel's protective covering should be restored.

Wooden reels should be stored off the ground to prevent rotting. Reels should be stored on a flat, hard surface so that flanges do not sink into the earth. The weight of the reel and cable must be carried at all times by the reel flanges.

Cable reels and lagging must not be stored for an extended time period sitting in direct contact with water or dampness. Timbers or metal supports must be placed under the reel flanges to provide elevated storage of the reels away from the direct contact with water or damp soil.

Reels should be stored in an area where construction equipment, falling or flying objects or other materials will not contact the cable.

Cable should be stored in an area where chemicals or petroleum products will not be spilled or sprayed on the cable.

Cable should be stored in an area away from open fires or sources of high heat.

If the reels are relocated, they should be handled as suggested in the "Recommended Reel Handling Practices" section, and inspection made on each reel during the relocation.

If the cables are stored in a secure area and not exposed to the effects of the weather, an annual inspection should be satisfactory.

Where the reels are exposed to the weather, a bimonthly inspection should be performed to observe any sign of deterioration.

If the reels are exposed in a non-secure area, policing of the area at frequent intervals may be required depending on circumstances.

Records of delivery date, manufacturer, installation date, any extenuating circumstances, along with all test reports, should be kept on file.

Pre-Installation

Overview

To ensure safety during cable installation and reliability once the cable is installed, you should confirm the following prior to installation:

- The cable selected is proper for your application
- The cable has not been damaged in transit or storage

Review all applicable state and national codes to verify that the cable chosen is appropriate for the job. Also, consult your local building authority.

Next, you must identify any existing cable damage and prevent any further damage from occurring. This is done through proper cable inspection, handling and storage.

Cable Inspection

Inspect every cable reel for damage before accepting the shipment. Be particularly alert for cable damage if:

- A reel is laying flat on its side
- Several reels are stacked
- Other freight is stacked on a reel
- Nails have been driven into reel flanges to secure shipping blocks
- A reel flange is damaged
- A cable covering is removed, stained or damaged
- A cable end seal is removed or damaged
- A reel has been dropped (hidden damage likely)

Cabling Handling

Remove all nails and staples from the reel flanges before moving a reel, and avoid all objects that could crush, gouge or impact the cable when moving. NEVER use the cable as a means to move a reel.

When unreeling, observe recommended bending radii, use swivels to prevent twisting and avoid overruns.

Installation – Overview and Checklist

Installation

Overview

Most cables are subjected to more mechanical stress during installation than they ever experience in actual operation. Needless to say, handling and pulling your cable according to manufacturer's recommendations is extremely important.

There are six main considerations in any cable installation:

- Ambient temperature
- Equipment
- Conduit fill
- Mechanical fit in raceway
- Physical limitations
- Knowledgeable installers

For more information, reference IEEE 1185 Recommended Practices for Cable Installations in Generating Stations and Industrial Facilities.

Installation Temperature

Low temperatures are a cause for concern when installing cable. Cable should not be installed when temperatures are less than the cold bend temperature rating of the cable product plus 15°C (i.e., minimum installation temperature = cold bend temperature rating + 15°C). The cold bend temperature rating is indicated on the catalog Spec sheet.

Prior to performing a low temperature (less than 10°F or -12°C) cable installation, cable should be stored for a minimum of 24 hours at a temperature of 55°F (13°C) or higher.

Cable should be pulled more slowly and trained in place the same day it is removed from storage. Do not impact, drop, kink or bend cable sharply in low temperatures.

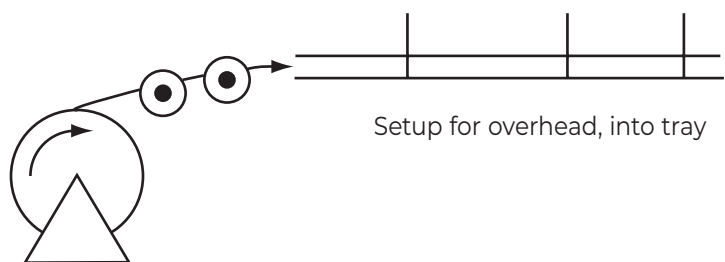
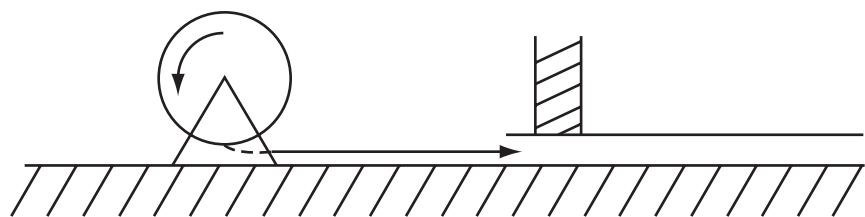
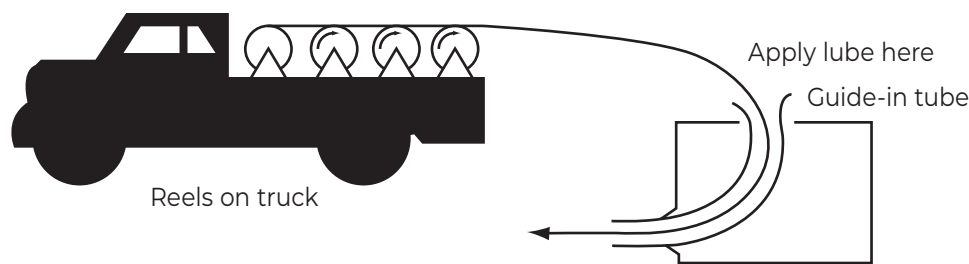
Equipment

The proper use of appropriate equipment is crucial to a successful cable installation. The equipment needed for most installations is detailed in the following checklist:

- 0-1/5/10 kip dynamometer
- basket grip pullers
- cable cutter
- cable end seals
- cable pulling lubricant
- cable tray bend sheaves
- cable tray rollers
- capstan-type puller
- diameter tape
- duct cleaning mandrels
- electric safety blankets and clamps
- extension cords and GFCI protection
- fish tape or string blower/vacuum
- floodlights
- gang rollers: with at least 4 ft. effective radius
- gloves
- guide-in flexible tubing (elephant trunks)
- hand winches (come-a-long)
- HI-POT tester
- lint-free rags
- make-up air blower & hose
- manhole edge sheave
- measuring tape
- personal protection equipment (PPE)
- plywood sheets
- portable electric generator
- pre-lubing devices
- pulling rope
- pump, diaphragm
- radios or telephones
- reel arbor
- reel brakes
- reel jacks
- several wire rope slings of various lengths
- shackles/clevis
- short ropes for temp tie-offs
- swivels
- warning flags, signs

Cable Feed-In Setups

The following diagrams illustrate various cable feed-in setups:



The feed-in setup should unreeel the cable with a natural curvature (Figure 1) as opposed to a reverse "S" curvature (Figure 2).

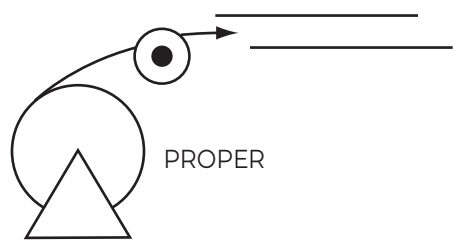


Figure 1

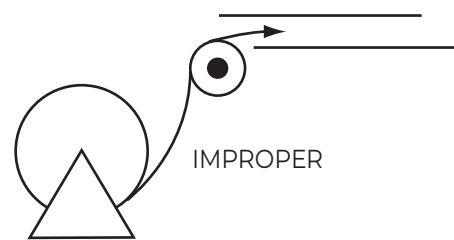


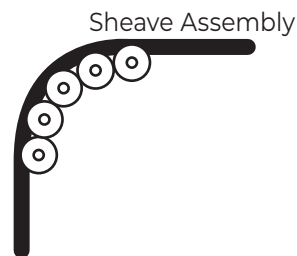
Figure 2

Cable Feed-In Setups (continued)

Single sheaves should only be used for GUIDING cables. Arrange multiple blocks to maintain bending radii whenever cable changes direction or elevation.



For pulling around bends, use conveyor sheave assemblies of the appropriate radius series.



The pulleys must be positioned to ensure that the effective curvature is smooth and changes direction or elevation evenly at each pulley. Never allow a polygon curvature to occur (Figure 3).

The fit of a pulley around the cable is also important when pulling heavy weights (i.e. pulleys at the top of a vertical drop).

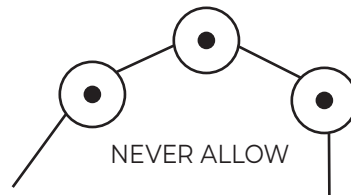
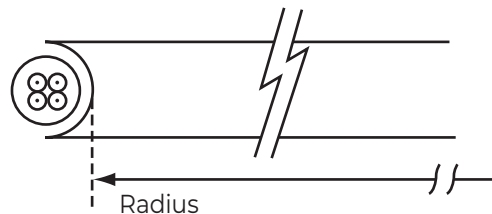


Figure 3

Remember to use the radius of the surface over which the cable is bent, not the outside flange diameter of the pulley. A "10 inch" cable sheave typically has a 10 inch outside flange diameter with a 6 inch inside diameter that provides an inside (bending) radius of 3 inches.



Installation – Conductor Maximum Pulling Tensions

Multi-Conductor Cables Having Equal-Sized Conductors; In Parallel or as Multiplexed Assemblies

AWG/kcmil	Maximum Allowable Pulling Tension (Lbs)					
	Number of Conductors					
	1	2	3	4	5	6
18	13	26	39	41	52	62
16	20	40	60	65	81	97
14	33	66	99	105	132	158
12	52	104	157	167	209	251
10	83	166	249	266	332	399
8	132	264	396	423	528	634
6	210	420	630	672	840	1008
4	334	668	1002	1069	1336	1603
2	531	1062	1593	1699	2124	2548
1	670	1339	2009	2142	2678	3214
1/0	845	1690	2534	2703	3379	4055
2/0	1065	2130	3194	3407	4259	5111
3/0	1342	2685	4027	4296	5370	6444
4/0	1693	3386	5078	5417	6771	8125
250	2000	4000	6000	6400	8000	9600
350	2800	5600	8400	8960	10000	10000
500	4000	8000	10000	10000	10000	10000
750	6000	10000	10000	10000	10000	10000
1000	8000	10000	10000	10000	10000	10000

The maximum allowable pulling tensions are for direct attachment to the conductor.

$T = 0.008 \times \text{cmil} \times n$, if $n \leq 3$

$T = 0.008 \times \text{cmil} \times n \times 0.8$, if $n > 3$

When more than two conductors are pulled in parallel in an installation containing bends, the maximum allowable pulling tension is limited to the two conductor column, regardless of the number of conductors that are being pulled.

Installation – Conductor Maximum Pulling Tensions

Multi-Conductor Cables Having Equal-Sized Conductors; Without Subassemblies

Number Of Conductors	Maximum Allowable Pulling Tension (Lbs)				
	Conductor Size (AWG/kcmil)				
	18	16	14	12	10
2	26	40	66	104	166
3	39	60	99	157	249
4	41	65	105	167	266
5	52	81	132	209	332
6	62	97	158	251	399
7	73	113	184	293	465
8	83	129	210	334	531
9	93	145	237	376	598
10	104	161	263	418	664
12	124	194	316	502	797
14	145	226	368	585	930
15	156	242	395	627	996
16	166	258	421	669	1000
18	187	290	473	752	1000
19	197	306	500	794	1000
20	207	323	526	836	1000
22	228	355	549	919	1000
24	249	387	631	1000	1000
25	259	403	658	1000	1000
30	311	484	789	1000	1000
37	383	596	974	1000	1000

The maximum allowable pulling tensions are for multi-conductor cables pulled into a raceway or cable tray using a basket grip or similar device secured directly to the cable jacket. It is recommended that a combination of basket grips and pulling eyes be used whenever possible.

$T = 0.008 \times \text{cmil} \times n$, if $n \leq 3$

$T = 0.008 \times \text{cmil} \times n \times 0.8$, if $n > 3$

Installation – Conductor Maximum Pulling Tensions

Physical Limitations Training and Bending

Overview

Training is the positioning of cable when it is not under tension. Bending is the positioning of cable when it is under tension. When installing cable, the object is to limit the mechanical forces so that the cable's physical and electrical characteristics are maintained for the expected service life. Depending on the pulling tension, a pulling bend radius value larger than the minimum may be required to limit the sidewall pressure. Bends in conductors, multi-conductor cables or assemblies of conductors shall be made so that the cable will not be damaged.

A non-shielded cable can tolerate a sharper bend than a shielded cable. This is especially true for cables having helically applied metallic shielding tapes which, when bent too sharply, can separate or buckle and cut into the insulation. Remember that offsets are bends.

The problem is compounded by the fact that most tapes are under jackets that conceal such damage. The extruded polymers used for insulation shields have sufficient conductivity and coverage initially to pass acceptance testing, then fail prematurely due to corona at the shield/insulation interface.

Minimum Bending Radius in Accordance with National Electric Code

Voltage	Conductors	Shielding	Cable Types	Minimum Bending Radius as a Multiple of Conductor/Assembly Diameter		
600 V	Single	Non-shielded	All	5X		
601-2000 V			All	8X		
600 V or 2000 V	Multi-conductor or Multiplexed	Non-shielded	TC or TC-ER	1 in. (25 mm) or less	Over 1 in. to 2 in. (>25 mm to 50 mm)	Over 2 in. (>50 mm)
				4X	5X	6X
		Shielded	MC ³	7X		
			All	12X		
			TC or TC-ER	12X		
			MC	12X/7X ¹		
Over 2000 V	Single	Non-shielded	MV	8X		
			MC ³	7X		
		Shielded	MC and MV	12X ²		
	Multi-conductor or Multiplexed	Non-shielded	MC and MV	8X		
		Shielded	MC and MV	12X/7X ^{1,2}		

¹ 12 times the diameter of an individual shielded conductor or 7 times the overall cable diameter, whichever is greater.

² Since UniShield® is a unique construction, there are no applicable values for the bending radius in the NEC. However, Prysmian Group recommends 8 times for single conductors, and for multiplexed or multi-conductor cables, it is 8 times the diameter of the individual conductors or 5 times the overall diameter, whichever is greater, in accordance with ANSI/ICEA S-93-639 5-46 kV *Shielded Power Cable for Use in the Transmission and Distribution of Electric Energy*.

³ Per 330.24B Interlocked-Type Armor or Continuously Corrugated Metallic Sheath.

Installation – Maximum Sidewall Pressure

Overview

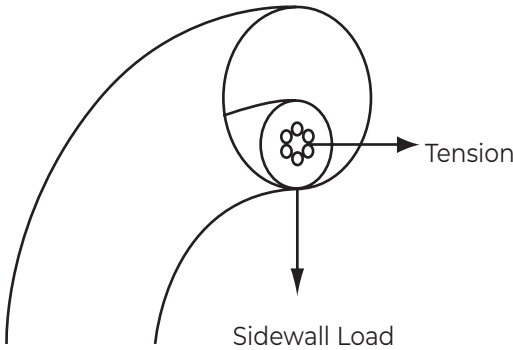
Sidewall bearing pressure (SWBP), or sidewall loading, is the radial force exerted on a cable being pulled around a conduit bend or sheave. Excessive SWBP can crush a cable and is, therefore, one of the most restrictive factors in installations having bends and requiring high pulling tensions. SWBP is reduced by increasing the radius of bends.

The maximum tension that can safely be applied to the cable during installation can be calculated using the maximum SWBP for the cable and the radius of the bend it is traversing.

For example, a cable having a maximum SWBP of 300 lb/ft that is being pulled around a bend having a radius of 2 feet should have no more than 300 lbs/ft x 2 ft or 600 lbs tension applied to it as the cable exits the bend.

Compatible Cable Pulling Lubricants:

American Polywater Corp.
Polywater® J
Polywater® LZ



CABLE TYPE	SWBP (LBS/FT)
300 V Non-shielded, 300 V and 600 V Shielded Control & Instrumentation	500
600 V Non-shielded Control & Instrumentation	500
600 V and 2400 V Non-shielded Power	1000
5 kV-35 kV Shielded Power	1000
Interlocked Armored Cable (all voltage)	300
CCW® MC-HL Armored Cable	500

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10060.4/0.1	12	17560.10.1	18	25060.16.5P	26	30060.10.5	30
10060.4.1	12	17560.12.1	18	25060.16.5T	26	30060.10.7	30
10060.6.1	12	17560.14.1	18	25060.16.7P	26	30060.10.9	30
10060.8.1	12	17560.250.1	18	25060.16.7T	26	30060.10.12	30
10060.10.1	12	17560.350.1	18	25060.16.9P	26	30060.10.19	30
10060.12.1	12	17560.500.1	18	25060.16.9T	26	30060.12.2	30
10060.14.1	12	17560.750.1	18	25060.16.12P	26	30060.12.3	30
10060.16.1	12	17560.1000.1	18	25060.16.12T	26	30060.12.4	30
10060.18.1	12	18560	20	25060.16.19P	26	30060.12.5	30
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10060.500.1	12	20060.16.4	22	25060.18.2T	26	30060.12.12	30
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12560.6.1	14	20060.18.3	22	25060.18.9T	26	30060.14.9	30
12560.8.1	14	20060.18.4	22	25060.18.12P	26	30060.14.12	30
12560.10.1	14	20060.18.5	22	25060.18.12T	26	30060.14.19	30
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15060.6.1	16	22560.16.30	24	27560.12.12	28	32560.4.4	32
15060.8.1	16	22560.16.37	24	27560.12.19	28	32560.6.3	32
15060.10.1	16	22560.18.2	24	27560.12.25	28	32560.6.4	32
15060.12.1	16	22560.18.3	24	27560.12.30	28	32560.8.3	32
15060.14.1	16	22560.18.4	24	27560.12.37	28	32560.8.4	32
15060.250.1	16	22560.18.5	24	27560.14.2	28	32560.250.3	32
15060.350.1	16	22560.18.7	24	27560.14.3	28	32560.250.4	32
15060.500.1	16	22560.18.9	24	27560.14.4	28	32560.350.3	32
15060.750.1	16	22560.18.12	24	27560.14.5	28	32560.350.4	32
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17560.2/0.1	18	22560.18.37	24	27560.14.19	28	32560.750.4	32
17560.2.1	18	25060.16.2P	26	27560.14.25	28	34060	34

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