ULTROL® 60+

ADVANCING NUCLEAR POWER

CABLE SOLUTIONS

to meet the application needs of nuclear power plants
TODAY AND INTO THE FUTURE

Prysmian Group

ULTROL® 60+
ADVANCING NUCLEAR POWER

PRYSMIAN GROUP DELIVERS

Advanced Reliability, Safety And Sustainability To The Nuclear Power Industry

Safe, Reliable Cable Solutions for Safe, Reliable Operation

With 50+ years of nuclear experience and continuous service, Prysmian Group is dedicated to advancing nuclear power and its commitment to providing safe and reliable electricity. We continue to invest in research and development to maintain and extend our leadership in technology, manufacturing and quality assurance—delivering nuclear-qualified cables with the design, performance and reliability to meet the needs of nuclear power plants both today and into the future.

At Prysmian Group, continuous improvement as it relates to safety and best practices, both within our organization and in every nuclear cable we design and manufacture, is part of our corporate culture—it's who we are. Our people are the powerful drivers behind our success as a nuclear wire and cable supplier and what differentiates us in the industry's eyes in terms of quality, service and performance. These are the talented and dedicated individuals with expert knowledge of what it takes to deliver technology-driven high-performance products for nuclear power plants to ensure long-standing, sound and reliable operation under any condition.

Delivering value through leadership, innovation and technology, Prysmian Group provides its nuclear customers with:

- A 50+ year track record of providing nuclear cable with proven quality and long-term reliability
- Solutions that are DecaBDE free and compliant with stringent EQ requirements
- Performance that meets/exceeds stringent standards and evolving safety expectations
- Optimized cable designs to ensure more than 60 years of trustworthy power plant operation
- Ongoing investment and a commitment to continued improvement in all areas of our company
- A strong proponent for energy independence, alternative energy sources and sustainability
- Dedicated service and support with the flexibility and responsiveness to deliver valuable results

As one of the most established wire and cable companies in the world, Prysmian Group has been leading the way in energy generation, transmission and distribution solutions for more than 175 years. We offer our valued nuclear customers the presence and strength of a large company, with the agility and responsiveness of a small one.

With more than 29,000 associates operating on six continents, Prysmian Group serves its customers through a global network of 108 manufacturing facilities in 50 countries, with sales representatives and distribution centers worldwide. The combination of breadth of product line, strong brand recognition, and dedicated distribution and customer service makes Prysmian Group your energy partner for the regeneration of nuclear power worldwide.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

Zero and Beyond – Because NOTHING Else is Acceptable

At Prysmian Group, our environmental, health and safety philosophy extends well beyond zero accidents in the workplace—it is in our DNA. Prysmian Group strongly encourages all of its associates to take responsibility for their decisions and actions, and to be role models of safety excellence to co-workers, families and communities.

While Prysmian Group's *Zero and Beyond* philosophy engages our associates at every level to think and act safely across all aspects of our business, we also embrace the unique safety requirements of the nuclear industry. With safety at the very core of our manufacturing excellence, all of our nuclear cables are designed to provide an infrastructure for safe and reliable nuclear operation.

Prysmian Group's corporate culture of safety provides:

- Absolute understanding that nuclear solutions must surpass the highest levels of safety and reliability
- Nuclear cables that are DecaBDE free and require no special PPE for safe handling and installation
- OHSAS 18001 or equivalent health and safety management systems in all facilities
- Comprehensive testing, design control and quality assurance to ensure optimized cable safety
- Demonstrated safety leadership across all manufacturing facilities with dedicated EHS officers
- Significant investment in infrastructure with a focus on safety first through consequence thinking
- Ongoing commitment to continually measure and improve safety through responsible discovery
- Significantly lower reported accident and illness rates than the industry average

Prysmian Group has one worldwide safety vision and goal – *ZERO AND BEYOND*. Through a corporate-wide practice of working safer by working together, Prysmian Group extends that vision and goal into every nuclear cable we design and manufacture.

Responsible Operations Deliver Sustainable Solutions

Prysmian Group recognizes our role and responsibility in promoting sustainability through continuous improvement in all areas of our company. As a result, our global facilities have fully implemented ISO 14001 or equivalent environmental management systems.

The quest to introduce new and better products through ongoing advancements in environmental designs reflects our commitment to achieving and exceeding industry standards and proactively responding to global environmental issues, while helping our nuclear customers deliver clean and reliable electricity. Just as important as internal sustainable practices is our inherent ability to design energy-efficient cables that are durable, reliable and optimized for long-standing, sustainable nuclear power plant operation.

Prysmian Group

Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

PRYSMIAN GROUP DELIVERS

Innovation for Next Generation Nuclear Power

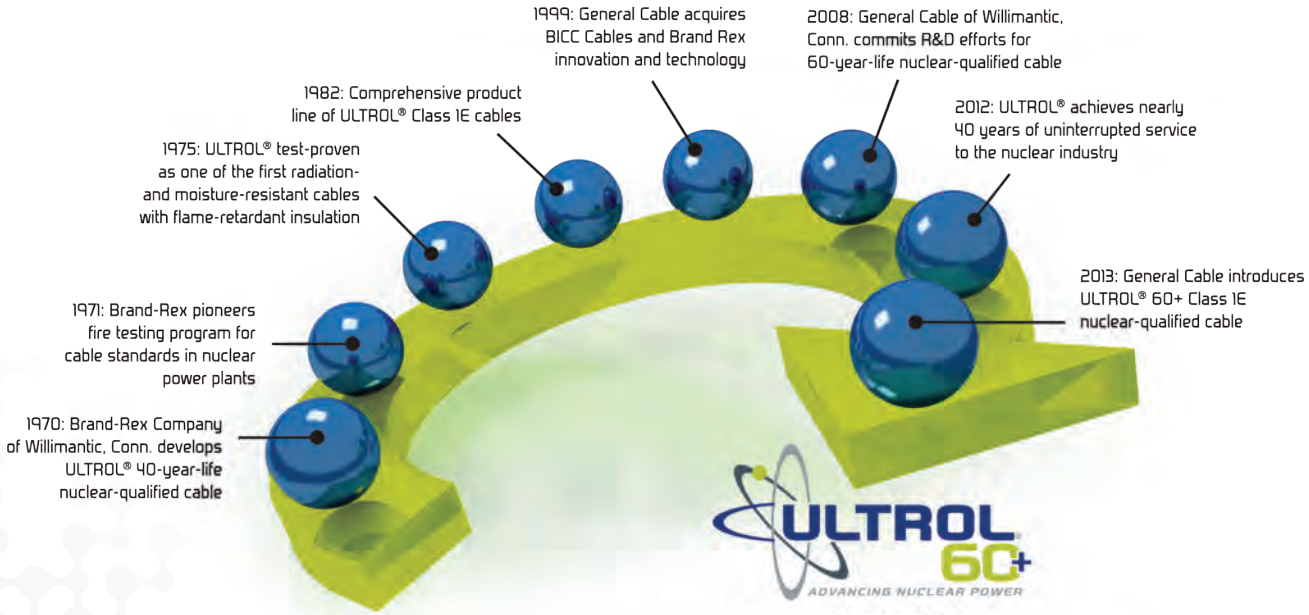
A History of Technological Advancements

For more than five decades, Prysmian Group has consistently delivered technologically advanced cables that have enabled nuclear power to remain a safe, affordable and reliable source of clean energy. With a proven track record that stems from an intimate involvement and strong position in the electric utility market, Prysmian Group is committed to partnering with our nuclear customers to share expert knowledge, identify evolving needs and solve today's tough nuclear application challenges, both inside containment and out.

Prysmian Group is strongly positioned to lead the nuclear industry well into the 21st century and beyond. Through ongoing investment in R&D, world-renowned testing, unsurpassed in-house compounding capabilities and a dedicated nuclear team, Prysmian Group has developed the latest materials and advanced cable formulations with proven performance to help our nuclear customers differentiate themselves with safe, reliable and optimized nuclear power plant operations for the next 60 years and beyond.

ULTROL® 60+—safe, reliable, advanced cable solutions for the next 60 years and beyond.

ULTROL® from 40 to 60



Delivers expected lifespan of 60 years and beyond

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® – A Trusted Name in Nuclear Wire and Cable

As one of the first radiation- and moisture-resistant cable with flame-retardant insulation to guarantee a 40-year service life, the ULTROL® name has been synonymous with reliability and safety in nuclear cable for more than 50 years. Backed by a continued commitment to provide the nuclear industry with cable solutions that deliver maximum service life, Prysmian Group extends ULTROL®'s demonstrated quality and performance with its latest mastery of technology — **ULTROL® 60+**.

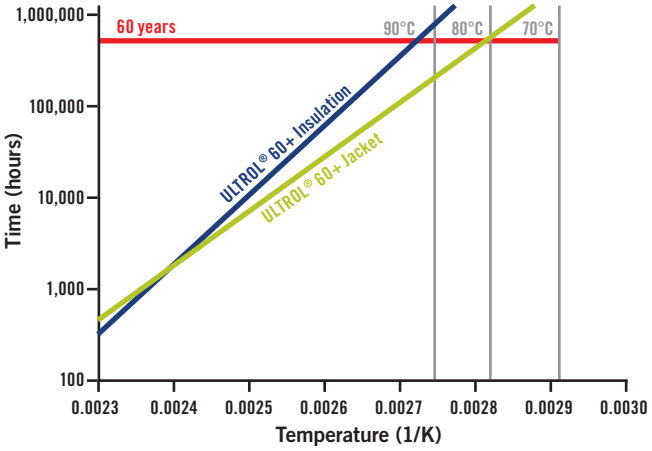
Based on a combination of ULTROL's original renowned technology and Prysmian Group's industry-leading R&D, processing capabilities and decades of nuclear experience, **ULTROL® 60+** features a unique balance of highly engineered insulation and jacket compounds coupled with high-grade copper conductors that ensure reliable electrical performance and superior durability under all operating conditions. Proven to meet the most rigorous Generation III reactor requirements for a 60-year operating life and beyond, **ULTROL® 60+** is ready to support the modernization and construction of pressurized and boiling water nuclear power plants worldwide.

ULTROL 60+ is a step above the rest:

- Satisfies the most stringent nuclear safety standards for inside and outside containment
- Conforms to all U.S. Nuclear Regulatory Commission and global requirements
- Demonstrates thermal aging and radiation resistance up to 350 MRad exposure levels, proving 60+ year service life
- Complies with stringent EQ requirements by being free of DecaBDE
- Meets/exceeds LOCA (loss-of-coolant accident) and HELB (high-energy line break) environmental qualification testing per IEEE 323 and IEEE 383
- Provides excellent wet electrical (submersion) performance upon aging at 90°C over two years
- Delivers reliability in extreme conditions (cold/hot temperatures, humidity, abrasion, fire performance in emergency, etc.)
- Offers new tougher, abrasion-resistant flame-retardant Cross-linked Polyolefin (XLPO) jacket compound

Based on comprehensive Arrhenius aging studies, ULTROL® 60+ has a predicted lifetime of more than 60 years.

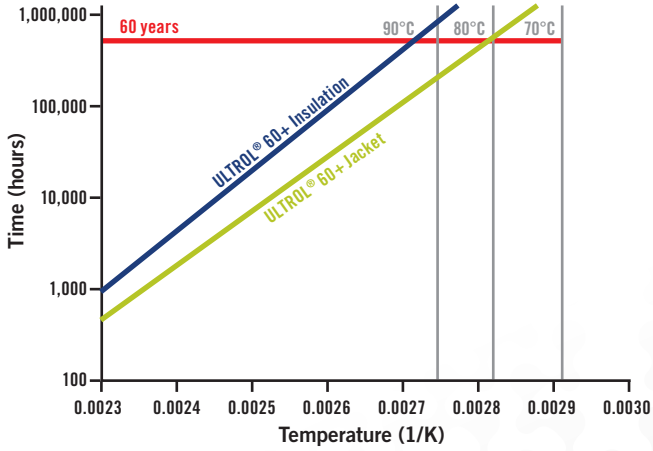
Arrhenius Fit - Medium Voltage



Compound: ULTROL® 60+ Medium-Voltage Insulation @ 90°C
Lifetime: 60+ years

Compound: ULTROL® 60+ Medium-Voltage Jacket @ 70°C
Lifetime: 100+ years

Arrhenius Fit - Low Voltage



Compound: ULTROL® 60+ Low-Voltage Insulation @ 90°C
Lifetime: 60+ years

Compound: ULTROL® 60+ Low-Voltage Jacket @ 70°C
Lifetime: 100+ years

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+
ADVANCING NUCLEAR POWER

PRYSMIAN GROUP DELIVERS

Quality Assurance, Manufacturing Excellence and Unwavering Dedication

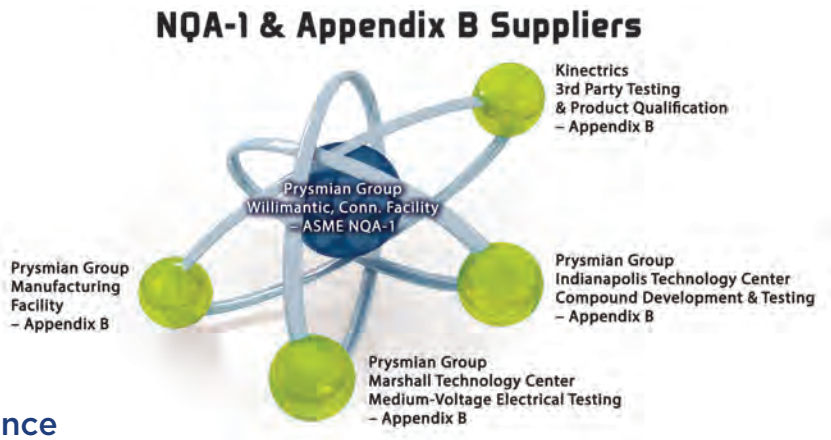
100% Quality Assurance Guaranteed

For more than a century, Prysmian Group 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 Group 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 Group'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



Lifelong Manufacturing Excellence

Having produced ULTROL® since 1970, Prysmian Group'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 Group'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.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

A Dedicated Nuclear Team

To address the special needs of the nuclear market, match current and future nuclear application needs, and remain a valuable resource with an uninterrupted record of supply, Prysmian Group backs **ULTROL® 60+** with a cross-functional nuclear team built on long-standing industry experience, technical know-how and a mindset of continuous improvement.

Prysmian Group's nuclear team is committed to identifying objectives, establishing goals, defining action plans and drawing upon Prysmian Group resources. Through active participation with standards bodies and long-term relationships with industry leaders, power plant operators, contractors and reactor manufacturers, our experienced team is empowered to satisfy and support a complex nuclear business—all with a commitment to safety and reliability.

Our experienced team is empowered to satisfy and support a complex nuclear business—all with a commitment to safety and reliability.

Prysmian Group

Quality Assurance Team:
Ensures compliance to the quality assurance programs and with nuclear specifications, testing and reporting

Sales and Business Team:
Has the nuclear expertise and flexibility to deliver responsive customer service and knowledgeable technical support

Applications Engineering Team:
Uses a fully integrated system approach to cable construction, consistently meeting current and future customer applications and industry requirements

Manufacturing Team:
Extensive nuclear experience deploying advanced cable technology and an ongoing commitment to continuous improvement

Dedicated Research & Development Team:
Delivers enhanced material innovation for improved reliability backed by advanced in-house and third-party testing

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+
ADVANCING NUCLEAR POWER

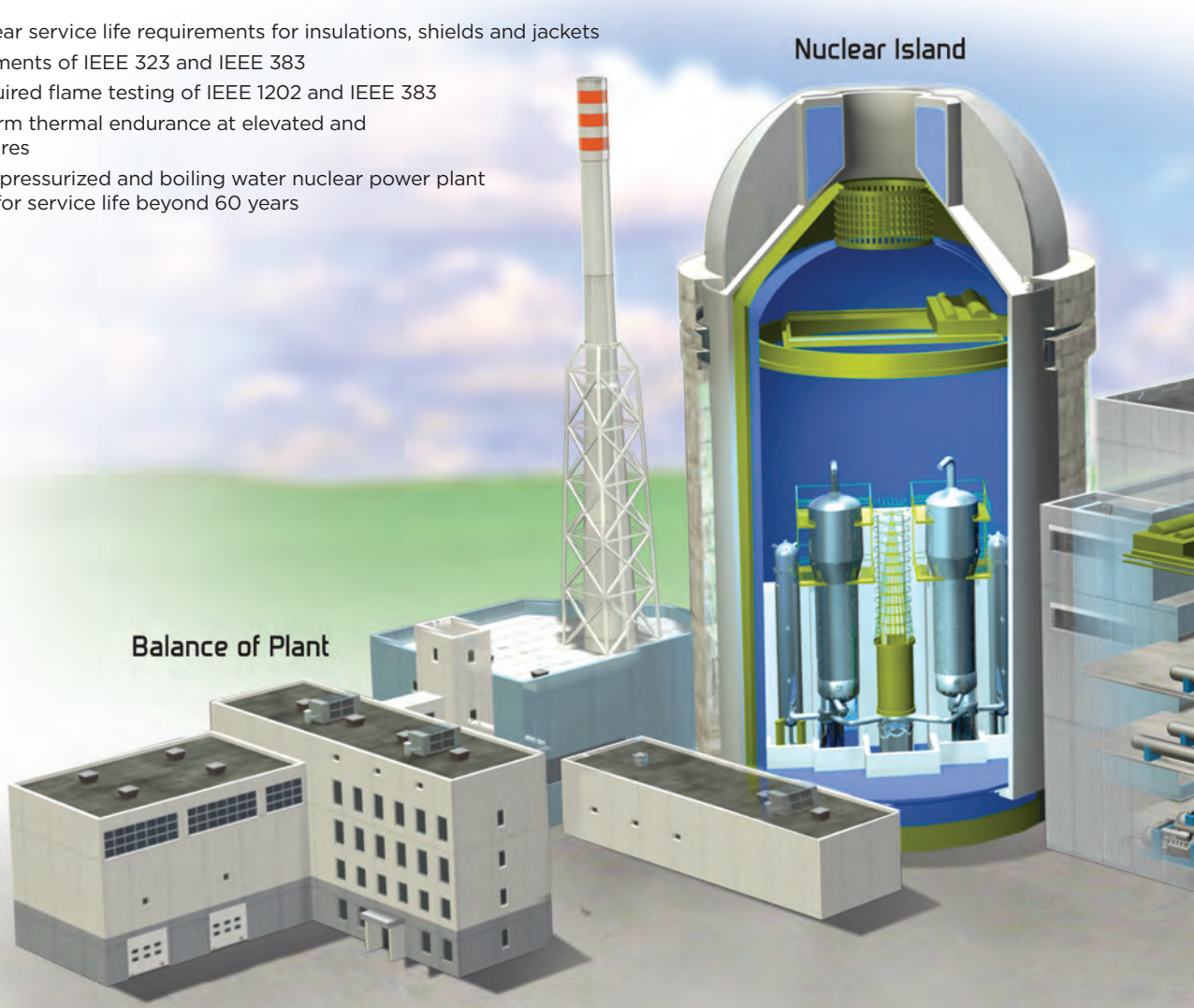
PRYSMIAN GROUP DELIVERS

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
- Offers long-term thermal endurance at elevated and low temperatures
- Meets current pressurized and boiling water nuclear power plant requirements for service life beyond 60 years



Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

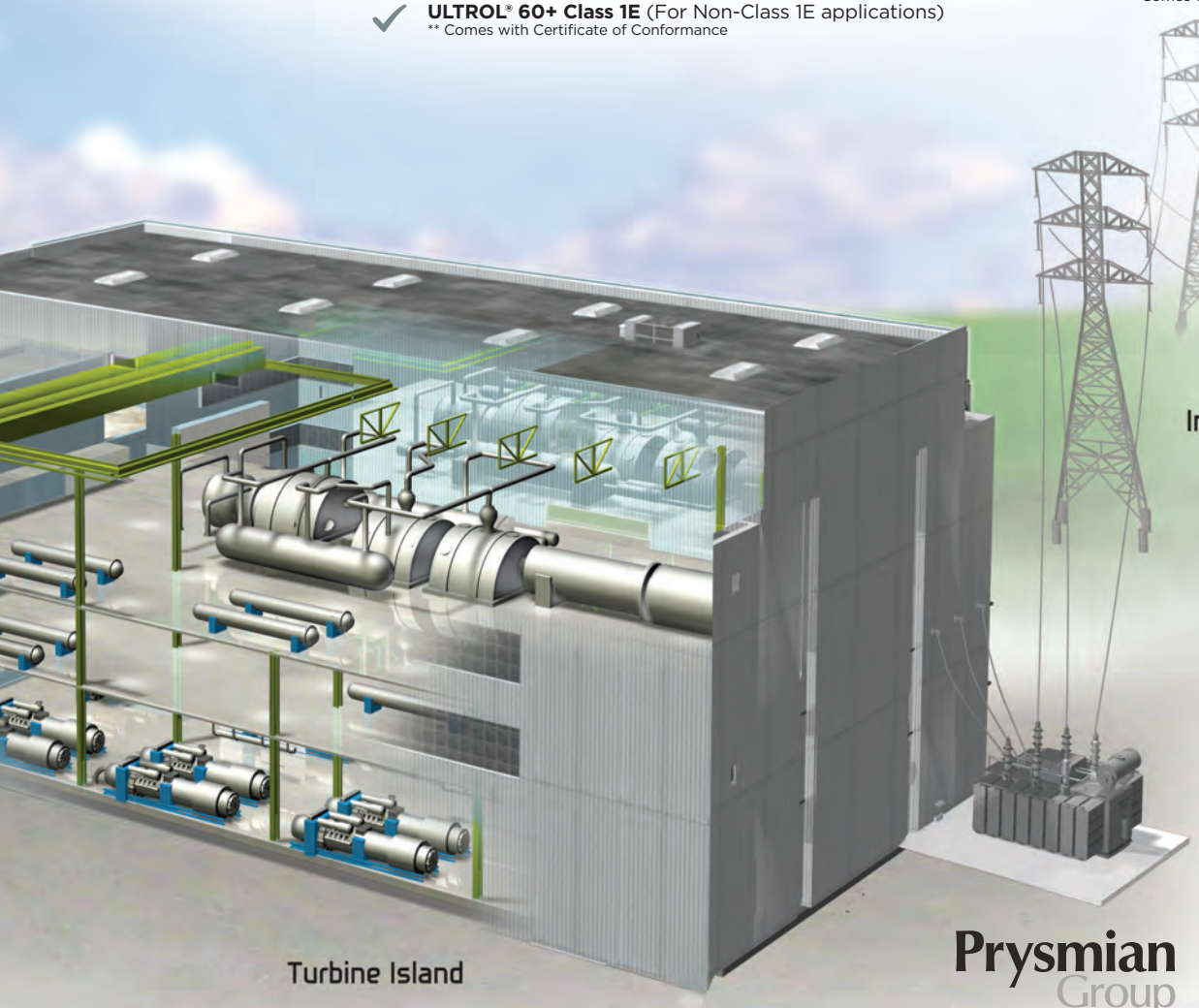
Nuclear Application and Product Cross-Reference			Low-Voltage Cables							Medium-Voltage Cables		High- & Extra-High-Voltage Cables	
Standard: IEEE		Application	Switchboard (SIS)	Instrumentation	Thermocouple	Control	Power	Copper Communication	Industrial-Grade Tray Cable Industrial Power Cable	Power	MV-105 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 1E**	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



Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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					
100-60	Single Conductor	600 V	FR-XLPE	18 AWG (0.82 mm²) - 1000 kcmil (507 mm²) Class B	
125-60	Single Conductor	600 V	FR-XLPE	18 AWG (0.82 mm²) - 1000 kcmil (507 mm²) 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 mm²) - 1000 kcmil (507 mm²) Class B	
175-60	Single Conductor Dual Wall	600 V	FR-XLPE / XLPO	14 AWG (2.08 mm²) - 1000 kcmil (507 mm²) 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 mm²) and 16 AWG (1.31 mm²) 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 mm²) and 16 AWG (1.31 mm²) Class B	
225-60	2 - 37 Multi-conductor Overall Shield	600 V	FR-XLPE / XLPO	18 AWG (0.82 mm²) and 16 AWG (1.31 mm²) Class B	
250-60	2 - 19 Pairs / Triads Individually Shielded Overall Shield	600 V	FR-XLPE / XLPO	18 AWG (0.82 mm²) and 16 AWG (1.31 mm²) 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 mm²) - 10 AWG (5.26 mm²) Class B	
300-60	2 - 37 Multi-conductor Overall Shield	600 V	FR-XLPE / XLPO	14 AWG (2.08 mm²) - 10 AWG (5.26 mm²) 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 mm²) - 750 kcmil (380 mm²) 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 mm²) - 1000 kcmil (507 mm²) Class B	
		15 kV (133%)	EPR / XLPO	2 AWG (33.6 mm²) - 1000 kcmil (507 mm²) Class B	

* -ER for > 2 conductors

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

TABLE OF CONTENTS

SECTION 1 ULTROL® 60+ CABLES 3-27

SECTION 2 TECHNICAL INFORMATION 29-50

ICON KEY

RATED CLASS 1E


RADIATION-RESISTANT


FLAME-RETARDANT


MOISTURE-RESISTANT


UV/SUNLIGHT-RESISTANT


CROSS-LINKED


OIL-RESISTANT


INCREASED FLEXIBILITY


CUT-THROUGH

COLD BEND

COLD BEND


HEAVY WALL

Prysmian Group

Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

NOTES

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

TABLE OF CONTENTS

SECTION 1 ULTROL® 60+ CABLES 3-27

ICON KEY

RATED CLASS 1E


RADIATION-RESISTANT


FLAME-RETARDANT


MOISTURE-RESISTANT


UV/SUNLIGHT-RESISTANT


CROSS-LINKED


OIL-RESISTANT


INCREASED FLEXIBILITY


CUT-THROUGH

COLD BEND

COLD BEND


HEAVY WALL

Prysmian Group

Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+ SIS Switchboard Wire Class B

Class 1E Nuclear

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

SPEC 100-60
May, 2023

RATED CLASS 1E | RADIATION-RESISTANT | FLAME-RETARDANT | MOISTURE-RESISTANT | UV/SUNLIGHT-RESISTANT | CROSS-LINKED | CUT-THROUGH | 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 GROUP (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 GROUP (WC) ULTROL® 60+ 1/C XXAWG COPPER FR-XLPE (UL) TYPE SIS/XHHW-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 GROUP (WC) ULTROL® 60+ 1/C XXXKCMIL COPPER FR-XLPE (UL) TYPE XHHW-2 600V 90C 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 insulated conductor, thermoset, Class 1E rated switchboard wire
- For use in Class 1E low-voltage applications in operation and interconnection of protective devices where optimum performance is required and where flame retardancy 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 test at -40°C

Industry Compliances:
- Class 1E Qualified in accordance with IEEE 323-1974/2003 and IEEE 383-1974/2003
- ICEA S-95-658
- UL 44 SIS/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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+ SIS Switchboard Wire
Class B

Class 1E Nuclear

600 V, 90°C, VW-1, UL Type SIS and Type SIS/XHHW-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	LBS/ 1000 FT	kg/km
10060.18.1	18	7/.0152	0.030	0.76	0.108	2.69	5	8	10	15
10060.16.1	16	7/.0192	0.030	0.76	0.118	2.95	8	12	14	21
10060.14.1	14	7/.0242	0.030	0.76	0.133	3.33	13	19	20	30
10060.12.1	12	7/.0305	0.030	0.76	0.152	3.81	20	30	28	42
10060.10.1	10	7/.0385	0.030	0.76	0.175	4.39	32	48	42	63
10060.8.1	8	7/.0486	0.045	1.14	0.236	5.92	51	76	71	105
10060.6.1	6	7/.0612	0.045	1.14	0.273	6.86	81	121	104	155
10060.4.1	4	7/.0772	0.045	1.14	0.320	8.05	129	192	158	235
10060.2.1	2	7/.0974	0.045	1.14	0.379	9.55	205	305	242	361
10060.1.1	1	19/.0664	0.055	1.40	0.437	11.0	258	384	305	453
10060.1/0.1	1/0	19/.0745	0.055	1.40	0.476	12.0	326	485	378	563
10060.2/0.1	2/0	19/.0837	0.055	1.40	0.521	13.2	411	612	470	700
10060.3/0.1	3/0	19/.0940	0.055	1.40	0.571	14.4	518	771	584	870
10060.4/0.1	4/0	19/.1055	0.055	1.40	0.627	15.9	653	972	728	1083
10060.250.1	250	37/.0822	0.065	1.65	0.695	17.6	772	1149	865	1287
10060.350.1	350	37/.0973	0.065	1.65	0.798	20.2	1081	1609	1192	1773
10060.500.1	500	37/.1162	0.065	1.65	0.927	23.4	1544	2297	1678	2497
10060.750.1	750	61/.1109	0.080	2.03	1.137	28.8	2316	3446	2507	3731
10060.1000.1	1000	61/.1280	0.080	2.03	1.287	32.6	3088	4595	3311	4926

Dimensions and weights are nominal; subject to industry tolerances.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

RATED CLASS 1E | 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 B174
- 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 GROUP (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 GROUP (WC) ULTROL® 60+ 1/C XXAWG COPPER FR-XLPE (UL) TYPE SIS/XHHW-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 GROUP (WC) ULTROL® 60+ 1/C XXXKCMIL COPPER FR-XLPE (UL) TYPE XHHW-2 600V 90C 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 flexible, single insulated conductor, thermoset, Class 1E rated switchboard wire
- For use in Class 1E low-voltage applications in operation and interconnection of protective devices where optimum performance is required and where flame retardancy 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 test at -40°C

Industry Compliances:

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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

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	LBS/ 1000 FT	kg/km
12560.18.1	18	16/.010	0.030	0.76	0.108	2.69	5	8	10	15
12560.16.1	16	26/.010	0.030	0.76	0.119	2.97	8	12	14	21
12560.14.1	14	41/.010	0.030	0.76	0.133	3.33	13	19	19	28
12560.12.1	12	65/.010	0.030	0.76	0.150	3.76	20	30	28	42
12560.10.1	10	105/.010	0.030	0.76	0.174	4.37	33	50	42	63
12560.8.1	8	133/.0111	0.045	1.14	0.257	6.45	52	77	73	109
12560.6.1	6	133/.0140	0.045	1.14	0.299	7.52	82	122	109	162
12560.4.1	4	133/.0177	0.045	1.14	0.353	8.89	132	196	165	245
12560.2.1	2	133/.0223	0.045	1.14	0.420	10.6	208	310	250	372
12560.1.1	1	259/.0180	0.055	1.40	0.476	12.0	266	396	320	476
12560.1/0.1	1/0	259/.0202	0.055	1.40	0.520	13.1	344	512	393	585
12560.2/0.1	2/0	259/.0227	0.055	1.40	0.571	14.4	422	628	491	730
12560.3/0.1	3/0	259/.0255	0.055	1.40	0.628	15.9	533	793	611	909
12560.4/0.1	4/0	259/.0286	0.055	1.40	0.714	18.1	670	997	759	1129
12560.250.1	250	427/.0242	0.065	1.65	0.761	19.2	795	1183	903	1344
12560.350.1	350	427/.0286	0.065	1.65	0.874	22.1	1110	1652	1239	1844
12560.500.1	500	427/.0342	0.065	1.65	1.034	26.2	1590	2366	1751	2605
12560.750.1	750	703/.0327	0.080	2.03	1.286	32.6	2410	3586	2644	3935
12560.1000.1	1000	703/.0377	0.080	2.03	1.458	36.9	3205	4769	3480	5178

Dimensions and weights are nominal; subject to industry tolerances.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+ Power Cable
Heavy Wall, Single Conductor
Class 1E Nuclear
600 V, 90°C, VW-1, UL Type RHH/RHW-2

SPEC 150-60
May, 2023

ULTROL® 60+ ADVANCING NUCLEAR POWER

RATED CLASS 1E | RADIATION-RESISTANT | FLAME-RETARDANT | MOISTURE-RESISTANT | UV/SUNLIGHT-RESISTANT | CROSS-LINKED | OIL-RESISTANT | CUT-THROUGH | COLD BEND | HEAVY WALL

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 GROUP (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 GROUP (WC) ULTROL® 60+ 1/C XXXKCMIL COPPER FR-XLPE (UL) TYPE RHH/RHW-2 600V 90C SUN RES FOR CT USE 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 applications in nuclear generating stations and where additional jacket protection is not required
- For use in Class 1E low-voltage power and lighting functions where optimum performance is required and where flame retardancy is critical
- May be installed in trays, conduit, ducts, or direct buried

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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	LBS/ 1000 FT	kg/km
15060.14.1	14	7/.0242	0.045	1.14	0.163	4.14	13	19	23	35
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	72
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	10.4	205	305	254	378
15060.1.1	1	19/.0664	0.080	2.03	0.488	12.4	258	384	329	490
15060.1/0.1	1/0	19/.0745	0.080	2.03	0.527	13.4	326	485	404	601
15060.2/0.1	2/0	19/.0837	0.080	2.03	0.572	14.5	411	612	498	742
15060.3/0.1	3/0	19/.0940	0.080	2.03	0.622	15.8	518	771	615	915
15060.4/0.1	4/0	19/.1055	0.080	2.03	0.678	17.2	653	972	761	1133
15060.250.1	250	37/.0822	0.095	2.41	0.754	19.2	772	1149	908	1352
15060.350.1	350	37/.0973	0.095	2.41	0.857	21.8	1081	1609	1241	1846
15060.500.1	500	37/.1162	0.095	2.41	0.986	25.0	1544	2297	1734	2580
15060.750.1	750	61/.1109	0.110	2.79	1.199	30.5	2316	3446	2581	3840
15060.1000.1	1000	61/.1280	0.110	2.79	1.349	34.3	3088	4595	3392	5048

Dimensions and weights are nominal; subject to industry tolerances.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+ Power Cable
Dual Wall, Single Conductor
Class 1E Nuclear
600 V, 90°C, VW-1, UL Type RHH/RHW-2

SPEC 175-60
May, 2023

ULTROL® 60+ ADVANCING NUCLEAR POWER

RATED CLASS 1E | RADIATION-RESISTANT | FLAME-RETARDANT | MOISTURE-RESISTANT | UV/SUNLIGHT-RESISTANT | CROSS-LINKED | OIL-RESISTANT | CUT-THROUGH | COLD BEND | HEAVY WALL

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- 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) — Black

Print:
- For 14 AWG thru 4/0 AWG:
  PRYSMIAN GROUP (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: SUN RES FOR CT USE TRACEABILITY NUMBER SEQUENTIAL FOOTAGE
- 250 kcmil THRU 1000 kcmil:
  PRYSMIAN GROUP (WC) ULTROL® 60+ 1/C XXXKCMIL COPPER FR-XLPE (UL) TYPE RHH/RHW-2 600V 90C SUN RES FOR CT USE 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 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 is critical
- May be installed in trays, conduit, ducts, or direct buried

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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	LBS/ 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	71
17560.8.1	8	7/.0486	0.045	1.14	0.015	0.38	0.268	6.81	51	76	78	116
17560.6.1	6	7/.0612	0.045	1.14	0.030	0.76	0.336	8.53	81	121	123	183
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	11.2	205	305	267	397
17560.1.1	1	19/.0664	0.055	1.40	0.045	1.14	0.530	13.5	258	384	347	517
17560.1/0.1	1/0	19/.0745	0.055	1.40	0.045	1.14	0.569	14.5	326	485	424	631
17560.2/0.1	2/0	19/.0837	0.055	1.40	0.045	1.14	0.614	15.6	411	612	520	774
17560.3/0.1	3/0	19/.0940	0.055	1.40	0.045	1.14	0.664	16.9	518	771	640	952
17560.4/0.1	4/0	19/.1055	0.055	1.40	0.045	1.14	0.720	18.3	653	972	788	1172
17560.250.1	250	37/.0822	0.065	1.65	0.065	1.65	0.829	21.1	772	1149	962	1432
17560.350.1	350	37/.0973	0.065	1.65	0.065	1.65	0.932	23.7	1081	1609	1302	1937
17560.500.1	500	37/.1162	0.065	1.65	0.065	1.65	1.061	27.0	1544	2297	1804	2685
17560.750.1	750	61/.1109	0.080	2.03	0.065	1.65	1.271	32.3	2316	3446	2661	3960
17560.1000.1	1000	61/.1280	0.080	2.03	0.065	1.65	1.421	36.1	3088	4595	3483	5183

Dimensions and weights are nominal; subject to industry tolerances.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

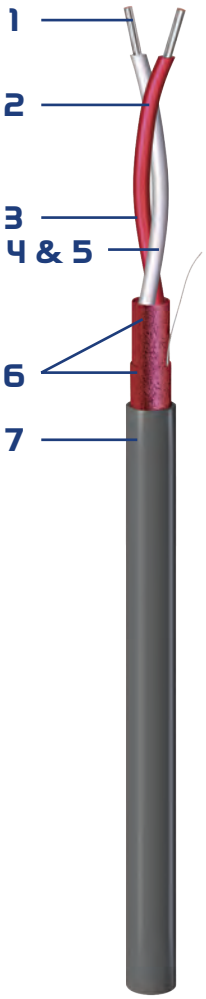
ULTROL® 60+ Thermocouple Extension Cable
Individually Shielded Pairs, Overall Shield

Class 1E Nuclear

600 V, 90°C, VW-1

SPEC 185-60
May, 2023

RATED CLASS 1E | RADIATION-RESISTANT | FLAME-RETARDANT | MOISTURE-RESISTANT | UV/SUNLIGHT-RESISTANT | CROSS-LINKED | OIL-RESISTANT | CUT-THROUGH | COLD BEND



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-MC96.1 as follows:

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

- In multi-pair cables, pair number is printed alpha-numerically on the positive conductor

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 GROUP (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 applications in nuclear generating stations
- Designed for use on critical circuits where total isolation is required between pairs 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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+ Instrumentation Cable Multi-Conductor

Class 1E Nuclear

600 V, 90°C, VW-1

SPEC 200-60
May, 2023

RATED CLASS 1E | 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) — Black

Print:
- PRYSMIAN GROUP (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 conductors

Applications:
- ULTROL® 60+ instrumentation cable is a 600 V multi-conductor, thermoset, Class 1E rated construction specifically designed for applications in nuclear generating stations and where flame retardancy 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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	LBS/ 1000 FT	kg/km
20060.18.2	2	18	7/.0152	0.025	0.64	0.045	1.14	0.305	7.75	10	15	55	82
20060.18.3	3	18	7/.0152	0.025	0.64	0.045	1.14	0.315	8.00	15	23	61	90
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	38	84	125
20060.18.7	7	18	7/.0152	0.025	0.64	0.045	1.14	0.400	10.16	35	53	104	155
20060.18.9	9	18	7/.0152	0.025	0.64	0.045	1.14	0.460	11.68	46	68	129	193
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	380
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	21.05	188	280	451	671
20060.16.2	2	16	7/.0192	0.025	0.64	0.045	1.14	0.320	8.13	16	24	59	88
20060.16.3	3	16	7/.0192	0.025	0.64	0.045	1.14	0.335	8.51	24	36	73	108
20060.16.4	4	16	7/.0192	0.025	0.64	0.045	1.14	0.365	9.27	32	48	90	134
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	0.500	12.70	73	108	169	251
20060.16.12	12	16	7/.0192	0.025	0.64	0.060	1.52	0.590	15.00	97	145	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	636
20060.16.30	30	16	7/.0192	0.025	0.64	0.060	1.52	0.880	22.35	244	363	543	807
20060.16.37	37	16	7/.0192	0.025	0.64	0.080	2.03	0.945	24.00	300	447	648	964

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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

Class 1E Nuclear

600 V, 90°C, VW-1

SPEC 225-60
May, 2023

RATED CLASS 1E | 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) — Black

Print:
- PRYSMIAN GROUP (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 conductors
- Tinned copper braid shield

Applications:
- ULTROL® 60+ instrumentation cable is a 600 V overall shielded multi-conductor, thermoset, Class 1E rated construction specifically designed for applications in nuclear generating stations and where flame retardancy 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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	LBS/ 1000 FT	kg/km
22560.18.2	2	18	7/.0152	0.025	0.64	20	0.045	1.14	0.291	7.39	13	20	57	85
22560.18.3	3	18	7/.0152	0.025	0.64	20	0.045	1.14	0.306	7.77	18	27	60	90
22560.18.4	4	18	7/.0152	0.025	0.64	20	0.045	1.14	0.332	8.43	23	35	79	117
22560.18.5	5	18	7/.0152	0.025	0.64	20	0.045	1.14	0.399	10.1	29	42	85	127
22560.18.7	7	18	7/.0152	0.025	0.64	20	0.045	1.14	0.428	10.9	39	57	106	158
22560.18.9	9	18	7/.0152	0.025	0.64	20	0.045	1.14	0.488	12.4	49	73	132	196
22560.18.12	12	18	7/.0152	0.025	0.64	20	0.045	1.14	0.557	14.2	64	96	164	244
22560.18.19	19	18	7/.0152	0.025	0.64	20	0.060	1.52	0.654	16.6	99	148	257	382
22560.18.25	25	18	7/.0152	0.025	0.64	20	0.060	1.52	0.747	19.0	130	194	327	487
22560.18.30	30	18	7/.0152	0.025	0.64	20	0.060	1.52	0.793	20.1	155	231	377	561
22560.18.37	37	18	7/.0152	0.025	0.64	20	0.080	2.03	0.890	22.6	191	284	449	668
22560.16.2	2	16	7/.0192	0.025	0.64	18	0.045	1.14	0.309	7.85	21	32	64	96
22560.16.3	3	16	7/.0192	0.025	0.64	18	0.045	1.14	0.325	8.26	29	44	77	114
22560.16.4	4	16	7/.0192	0.025	0.64	18	0.045	1.14	0.353	8.97	37	56	93	138
22560.16.5	5	16	7/.0192	0.025	0.64	18	0.045	1.14	0.433	11.0	46	68	109	162
22560.16.7	7	16	7/.0192	0.025	0.64	18	0.045	1.14	0.465	11.8	62	92	137	204
22560.16.9	9	16	7/.0192	0.025	0.64	18	0.060	1.52	0.561	14.3	78	116	170	253
22560.16.12	12	16	7/.0192	0.025	0.64	18	0.060	1.52	0.620	15.8	103	153	235	349
22560.16.19	19	16	7/.0192	0.025	0.64	18	0.060	1.52	0.711	18.1	159	237	337	501
22560.16.25	25	16	7/.0192	0.025	0.64	18	0.060	1.52	0.814	20.7	208	310	430	640
22560.16.30	30	16	7/.0192	0.025	0.64	18	0.080	2.03	0.904	23.0	249	371	542	806
22560.16.37	37	16	7/.0192	0.025	0.64	18	0.080	2.03	0.967	24.6	305	454	643	957

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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

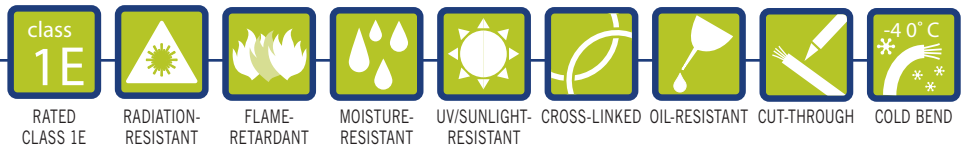
ULTROL® 60+ Instrumentation Cable
Individually Shielded Pairs or Triads
Overall Shield

Class 1E Nuclear

600 V, 90°C, VW-1

SPEC 250-60
May, 2023

ULTROL® 60+ ADVANCING NUCLEAR POWER



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) — Black

Print:
- PRYSMIAN GROUP (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 conductors
- Tinned copper braid shield

Applications:
- ULTROL® 60+ instrumentation cable is a 600 V individual shielded pairs or triads with overall shield, thermoset, Class 1E rated construction specifically designed for applications in nuclear generating stations and where flame retardancy is critical

Applications (cont'd):
- 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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	LBS/ 1000 FT	kg/km
25060.18.2P	2 SPS	18	7/.0152	0.025	0.64	20	0.045	1.14	0.462	11.7	30	45	140	208
25060.18.3P	3 SPS	18	7/.0152	0.025	0.64	20	0.045	1.14	0.490	12.5	43	65	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	105	290	432
25060.18.7P	7 SPS	18	7/.0152	0.025	0.64	20	0.060	1.52	0.673	17.1	97	145	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	0.495	12.6	48	71	180	268
25060.16.3P	3 SPS	16	7/.0192	0.025	0.64	18	0.060	1.52	0.556	14.1	69	103	239	356
25060.16.4P	4 SPS	16	7/.0192	0.025	0.64	18	0.060	1.52	0.608	15.4	91	135	307	456
25060.16.5P	5 SPS	16	7/.0192	0.025	0.64	18	0.060	1.52	0.665	16.9	113	168	370	550
25060.16.7P	7 SPS	16	7/.0192	0.025	0.64	18	0.060	1.52	0.725	18.4	156	232	401	597
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	593
25060.18.7T	7 STS	18	7/.0152	0.025	0.64	20	0.060	1.52	0.714	18.1	133	198	433	645
25060.18.9T	9 STS	18	7/.0152	0.025	0.64	20	0.060	1.52	0.833	21.2	170	253	533	794
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	0.554	14.1	64	96	241	359
25060.16.3T	3 STS	16	7/.0192	0.025	0.64	18	0.060	1.52	0.587	14.9	94	139	325	484
25060.16.4T	4 STS	16	7/.0192	0.025	0.64	18	0.060	1.52	0.642	16.3	124	185	423	630
25060.16.5T	5 STS	16	7/.0192	0.025	0.64	18	0.060	1.52	0.704	17.9	154	229	506	752
25060.16.7T	7 STS	16	7/.0192	0.025	0.64	18	0.060	1.52	0.768	19.5	213	317	553	823
25060.16.9T	9 STS	16	7/.0192	0.025	0.64	18	0.080	2.03	0.939	23.9	272	405	762	1134
25060.16.12T	12 STS	16	7/.0192	0.025	0.64	18	0.080	2.03	1.055	26.8	361	537	958	1425
25060.16.19T	19 STS	16	7/.0192	0.025	0.64	18	0.080	2.03	1.236	31.4	569	847	1287	1916

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

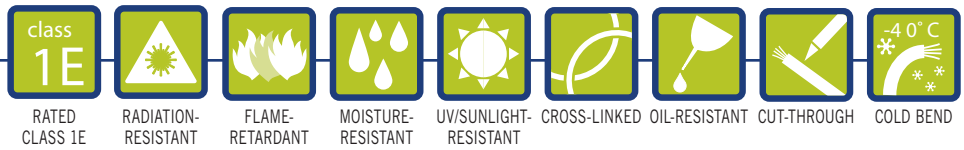
Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+ Control Cable
Multi-Conductor

Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER*

SPEC 275-60
May, 2023



RATED CLASS 1E | 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) — Black

Print:
- PRYSMIAN GROUP (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 conductors
- E-2 color code

Applications:
- ULTROL® 60+ control cable is a 600 V multi-conductor, thermoset, Class 1E rated construction specifically designed for applications in nuclear generating stations and where flame retardancy is critical
- For use in Class 1E power distribution and control circuits for power lighting, control and signal circuits
- 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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	LBS/ 1000 FT	kg/km
27560.14.2	2	14	7/.0242	0.030	0.76	0.045	1.14	0.359	9.12	26	38	87	130
27560.14.3	3	14	7/.0242	0.030	0.76	0.045	1.14	0.379	9.63	38	57	98	146
27560.14.4	4	14	7/.0242	0.030	0.76	0.045	1.14	0.414	10.5	51	76	122	182
27560.14.5	5	14	7/.0242	0.030	0.76	0.045	1.14	0.452	11.5	64	95	142	211
27560.14.7	7	14	7/.0242	0.030	0.76	0.045	1.14	0.492	12.5	90	134	201	299
27560.14.9	9	14	7/.0242	0.030	0.76	0.060	1.52	0.603	15.3	116	173	277	412
27560.14.12	12	14	7/.0242	0.030	0.76	0.060	1.52	0.675	17.2	155	231	339	505
27560.14.19	19	14	7/.0242	0.030	0.76	0.060	1.52	0.785	19.9	245	365	536	797
27560.14.25	25	14	7/.0242	0.030	0.76	0.080	2.03	0.951	24.2	321	478	661	984
27560.14.30	30	14	7/.0242	0.030	0.76	0.080	2.03	1.013	25.7	385	573	836	1244
27560.14.37	37	14	7/.0242	0.030	0.76	0.080	2.03	1.091	27.7	476	708	924	1375
27560.12.2	2	12	7/.0305	0.030	0.76	0.045	1.14	0.397	10.1	41	61	112	167
27560.12.3	3	12	7/.0305	0.030	0.76	0.045	1.14	0.420	10.7	61	91	129	192
27560.12.4	4	12	7/.0305	0.030	0.76	0.045	1.14	0.460	11.7	81	121	182	271
27560.12.5	5	12	7/.0305	0.030	0.76	0.045	1.14	0.503	12.8	102	152	216	322
27560.12.7	7	12	7/.0305	0.030	0.76	0.060	1.52	0.579	14.7	143	213	289	430
27560.12.9	9	12	7/.0305	0.030	0.76	0.060	1.52	0.671	17.1	184	274	379	564
27560.12.12	12	12	7/.0305	0.030	0.76	0.060	1.52	0.754	19.2	245	365	479	713
27560.12.19	19	12	7/.0305	0.030	0.76	0.080	2.03	0.923	23.4	389	579	738	1098
27560.12.25	25	12	7/.0305	0.030	0.76	0.080	2.03	1.067	27.1	512	762	913	1358
27560.12.30	30	12	7/.0305	0.030	0.76	0.080	2.03	1.138	28.9	613	912	1058	1574
27560.12.37	37	12	7/.0305	0.030	0.76	0.080	2.03	1.227	31.2	756	1125	1274	1896
27560.10.2	2	10	7/.0385	0.030	0.76	0.045	1.14	0.443	11.3	65	96	147	219
27560.10.3	3	10	7/.0385	0.030	0.76	0.045	1.14	0.470	11.9	97	144	177	263
27560.10.4	4	10	7/.0385	0.030	0.76	0.045	1.14	0.515	13.1	130	194	265	394
27560.10.5	5	10	7/.0385	0.030	0.76	0.060	1.52	0.595	15.1	162	241	324	483
27560.10.7	7	10	7/.0385	0.030	0.76	0.060	1.52	0.648	16.5	227	338	388	578
27560.10.9	9	10	7/.0385	0.030	0.76	0.060	1.52	0.754	19.2	292	435	550	818
27560.10.12	12	10	7/.0385	0.030	0.76	0.080	2.03	0.890	22.6	390	580	684	1018
27560.10.19	19	10	7/.0385	0.030	0.76	0.080	2.03	1.038	26.4	614	918	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.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER*

SPEC 300-60
May, 2023

ULTROL® 60+ ADVANCING NUCLEAR POWER

RATED CLASS 1E | 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) — Black

Print:
- PRYSMIAN GROUP (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 conductors
- E-2 color code
- Longitudinal corrugated tinned copper tape shield

Applications:
- ULTROL® 60+ control cable is a 600 V overall shielded, multi-conductor, thermoset, Class 1E rated construction specifically designed for applications in nuclear generating stations and where flame retardancy 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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	LBS/ 1000 FT	kg/km
30060.14.2	2	14	7/.0242	0.030	0.76	16	0.045	1.14	0.359	9.12	34	50	98	145
30060.14.3	3	14	7/.0242	0.030	0.76	16	0.045	1.14	0.379	9.63	47	69	108	161
30060.14.4	4	14	7/.0242	0.030	0.76	16	0.045	1.14	0.414	10.5	59	88	134	199
30060.14.5	5	14	7/.0242	0.030	0.76	16	0.045	1.14	0.512	13.0	72	108	152	227
30060.14.7	7	14	7/.0242	0.030	0.76	16	0.060	1.52	0.582	14.8	98	146	211	313
30060.14.9	9	14	7/.0242	0.030	0.76	16	0.060	1.52	0.663	16.8	124	185	289	430
30060.14.12	12	14	7/.0242	0.030	0.76	16	0.060	1.52	0.736	18.7	163	243	352	524
30060.14.19	19	14	7/.0242	0.030	0.76	16	0.080	2.03	0.888	22.6	251	374	546	812
30060.14.25	25	14	7/.0242	0.030	0.76	16	0.080	2.03	1.014	25.8	330	491	675	1005
30060.14.30	30	14	7/.0242	0.030	0.76	16	0.080	2.03	1.076	27.3	394	586	852	1268
30060.14.37	37	14	7/.0242	0.030	0.76	16	0.080	2.03	1.154	29.3	484	720	1055	1570
30060.12.2	2	12	7/.0305	0.030	0.76	14	0.045	1.14	0.397	10.0	54	80	129	192
30060.12.3	3	12	7/.0305	0.030	0.76	14	0.045	1.14	0.420	10.7	74	110	145	216
30060.12.4	4	12	7/.0305	0.030	0.76	14	0.045	1.14	0.460	11.7	94	140	198	295
30060.12.5	5	12	7/.0305	0.030	0.76	14	0.060	1.52	0.607	15.4	115	171	229	341
30060.12.7	7	12	7/.0305	0.030	0.76	14	0.060	1.52	0.653	16.6	156	232	305	453
30060.12.9	9	12	7/.0305	0.030	0.76	14	0.060	1.52	0.745	18.9	197	293	394	587
30060.12.12	12	12	7/.0305	0.030	0.76	14	0.060	1.52	0.828	21.0	258	384	495	736
30060.12.19	19	12	7/.0305	0.030	0.76	14	0.080	2.03	0.997	25.3	401	597	754	1122
30060.12.25	25	12	7/.0305	0.030	0.76	14	0.080	2.03	1.141	29.0	525	781	929	1383
30060.12.30	30	12	7/.0305	0.030	0.76	14	0.080	2.03	1.211	30.8	626	932	1074	1599
30060.12.37	37	12	7/.0305	0.030	0.76	14	0.080	2.03	1.301	33.1	769	1144	1291	1921
30060.10.2	2	10	7/.0385	0.030	0.76	12	0.045	1.14	0.443	11.3	85	127	173	258
30060.10.3	3	10	7/.0385	0.030	0.76	12	0.045	1.14	0.470	11.9	118	176	202	301
30060.10.4	4	10	7/.0385	0.030	0.76	12	0.045	1.14	0.515	13.1	150	223	291	433
30060.10.5	5	10	7/.0385	0.030	0.76	12	0.060	1.52	0.688	17.5	183	272	349	519
30060.10.7	7	10	7/.0385	0.030	0.76	12	0.060	1.52	0.740	18.8	248	369	415	618
30060.10.9	9	10	7/.0385	0.030	0.76	12	0.080	2.03	0.887	22.5	313	466	570	849
30060.10.12	12	10	7/.0385	0.030	0.76	12	0.080	2.03	0.982	24.9	411	612	709	1055
30060.10.19	19	10	7/.0385	0.030	0.76	12	0.080	2.03	1.130	28.7	638	950	1038	1545

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

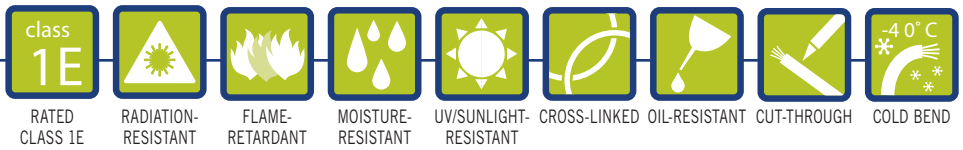
Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+ Power Cable
3 or 4 Conductors with Ground

Class 1E Nuclear

600 V, 90°C, VW-1, UL Type TC-ER

ULTROL® 60+ ADVANCING NUCLEAR POWER



RATED CLASS 1E | RADIATION-RESISTANT | FLAME-RETARDANT | MOISTURE-RESISTANT | UV/SUNLIGHT-RESISTANT | CROSS-LINKED | OIL-RESISTANT | CUT-THROUGH | COLD BEND

Product Construction

1. Conductor:
- 8 AWG thru 750 kcmil 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. 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) — Black

Print:
- PRYSMIAN GROUP (WC) ULTROL® 60+ XX/C XXAWG WITH GRND 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

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 applications in nuclear generating stations and where flame retardancy is critical
- For use in Class 1E power distribution and control circuits for power lighting, control and signal circuits
- 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
- 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 spools on non-returnable wooden reels

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	LBS/ 1000 FT	kg/km
32560.8.3	3	8	7/.0486	0.045	1.14	10	0.060	1.52	0.629	16.0	187	278	328	488
32560.8.4	4	8	7/.0486	0.045	1.14	10	0.060	1.52	0.690	17.5	238	354	406	604
32560.6.3	3	6	7/.0612	0.045	1.14	8	0.060	1.52	0.708	18.0	297	442	477	710
32560.6.4	4	6	7/.0612	0.045	1.14	8	0.060	1.52	0.779	19.8	379	564	593	882
32560.4.3	3	4	7/.0772	0.045	1.14	8	0.060	1.52	0.810	20.6	442	658	707	1052
32560.4.4	4	4	7/.0772	0.045	1.14	8	0.080	2.03	0.932	23.7	572	851	878	1306
32560.2.3	3	2	7/.0974	0.045	1.14	6	0.080	2.03	0.977	24.8	701	1043	1015	1511
32560.2.4	4	2	7/.0974	0.045	1.14	6	0.080	2.03	1.075	27.3	908	1351	1279	1904
32560.1.3	3	1	19/.0664	0.055	1.14	6	0.080	2.03	1.115	28.3	861	1281	1282	1907
32560.1.4	4	1	19/.0664	0.055	1.14	6	0.080	2.03	1.225	31.1	1122	1670	1735	2581
32560.1/0.3	3	1/0	19/.0745	0.055	1.40	6	0.080	2.03	1.186	30.1	1081	1609	1481	2204
32560.1/0.4	4	1/0	19/.0745	0.055	1.40	6	0.080	2.03	1.309	33.3	1395	2076	1894	2818
32560.2/0.3	3	2/0	19/.0837	0.055	1.40	6	0.080	2.03	1.283	32.6	1323	1969	1792	2667
32560.2/0.4	4	2/0	19/.0837	0.055	1.40	6	0.080	2.03	1.418	36.0	1737	2585	2300	3422
32560.3/0.3	3	3/0	19/.0940	0.055	1.40	4	0.080	2.03	1.391	35.3	1694	2521	2211	3290
32560.3/0.4	4	3/0	19/.0940	0.055	1.40	4	0.080	2.03	1.538	39.1	2217	3299	2838	4223
32560.4/0.3	3	4/0	19/.1055	0.055	1.40	4	0.080	2.03	1.511	38.4	2102	3128	2694	4009
32560.4/0.4	4	4/0	19/.1055	0.055	1.40	4	0.110	2.79	1.734	44.0	2760	4107	3587	5337
32560.250.3	3	250	37/.0822	0.065	1.65	4	0.080	2.03	1.658	42.1	2460	3661	3280	4881
32560.250.4	4	250	37/.0822	0.065	1.65	4	0.110	2.79	1.898	48.2	3239	4820	4189	6233
32560.350.3	3	350	37/.0973	0.065	1.65	3	0.110	2.79	1.940	49.3	3437	5115	4410	6562
32560.350.4	4	350	37/.0973	0.065	1.65	3	0.110	2.79	2.146	54.5	4517	6722	5699	8480
32560.500.3	3	500	37/.1162	0.065	1.65	2	0.110	2.79	2.218	56.3	4866	7242	6010	8943
32560.500.4	4	500	37/.1162	0.065	1.65	2	0.110	2.79	2.458	62.4	6424	9560	7776	11571
32560.750.3	3	750	61/.1109	0.080	2.03	1	0.110	2.79	2.670	67.8	7249	10788	9014	13413
32560.750.4	4	750	61/.1109	0.080	2.03	1	0.140	3.56	3.025	76.8	9585	14264	11660	17351

Dimensions and weights are nominal; subject to industry tolerances.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

SPEC 340-60
May, 2023

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

RATED CLASS 1E | 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) — Black

Print:

- PRYSMIAN GROUP (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 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
- 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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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	SIZE RANGE (AWG/kcmil)	INSULATION THICKNESS (mils)
5 kV (133%), 8 kV (100%)	6 thru 1000	115
15 kV (133%)	2 thru 1000	220

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

NOTES

Prysmian Group

Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

TABLE OF CONTENTS

SECTION 2	TECHNICAL INFORMATION	29-50

Prysmian Group

Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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
	Kilofeet (1000 feet)	Kilometers	0.3048
	Kilometers	Kilofeet (1000 feet)	3.2808
Area	Square Inches	Square Millimeters	645.16
	Square Millimeters	Square Inches	0.00155
	Square Inches	Square Centimeters	6.4516
	Square Centimeters	Square Inches	0.155
	Square Inches	Circular Mils	1,273,240
	Circular Mils	Square Inches	7.854×10^{-7}
	Circular Mils	Square Millimeters	5.066×10^{4}
	Square Millimeters	Circular Mils	1973.51
	Square Feet	Square Meters	0.0929
	Square Meters	Square Feet	10.764
Weight	Pounds	Kilograms	0.4536
	Kilograms	Pounds	2.2046
	Pound/Kilofeet	Kilograms/Kilometer	1.4882
	Kilograms/Kilometer	Pounds/Kilofeet	0.6720
Electrical	Ohms/Kilofeet	Ohms/Kilometer	3.2808
	Ohms/Kilometer	Ohms/Kilofeet	0.3048
	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
Mechanical	Pounds/Square Inch	Kilo Pascal*	6.895
	Kilo Pascal*	Pounds/Square Inch	0.1432
	Pounds (force)	Newtons	4.448

* 1 Pascal = 1 Newton/square meters

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

AWG to mm² CONVERSION TABLE	
AWG/kcmil	[mm²]*
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

mm² to AWG CONVERSION TABLE		
mm²	[mm²] *	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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

Class B Conductors for General Wiring

Copper Conductor

ASTM CLASS B

COND. SIZE	STRANDING	NOMINAL AREA		NOMINAL WEIGHT		CONCENTRIC NOMINAL O.D.		COMPRESSED NOMINAL O.D.		COMPACT NOMINAL O.D.	
AWG/kcmil	INCHES	CIRCULAR MILS	mm²	LBS/1000 FT[1]	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.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

Class C Conductors for General Wiring

Copper Conductor

ASTM CLASS C

SIZE	STRANDING	NOMINAL AREA		NOMINAL DIAMETER		NOMINAL WEIGHT	
AWG/kcmil	INCHES	CIRCULAR MILS	mm^2	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.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

Class I Conductors for General Wiring

Copper Conductor

ASTM CLASS I

SIZE	STRANDING	NOMINAL AREA		NOMINAL DIAMETER		NOMINAL WEIGHT	
AWG/kcmil	INCHES	CIRCULAR MILS	mm^2	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.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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.

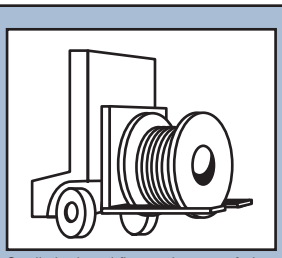
Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL 60+ ADVANCING NUCLEAR POWER

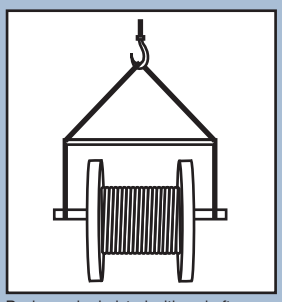
Recommended Reel Handling Practices

How to Handle Cable Reels

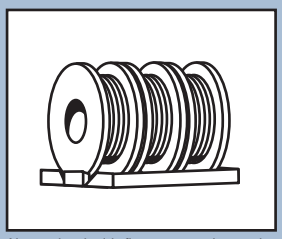
YES



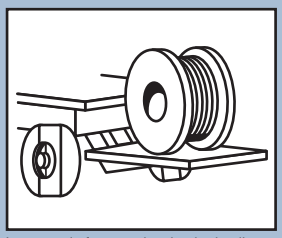
Cradle both reel flanges between forks.



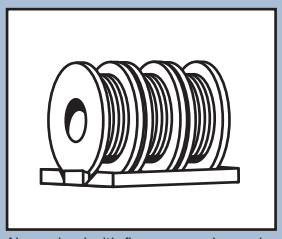
Reels can be hoisted with a shaft extended through both flanges.



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

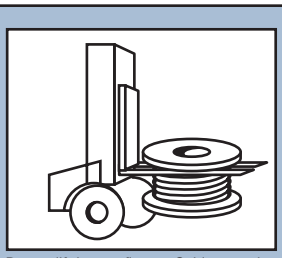


Lower reels from truck using hydraulic gate, hoist or fork lift. LOWER CAREFULLY.

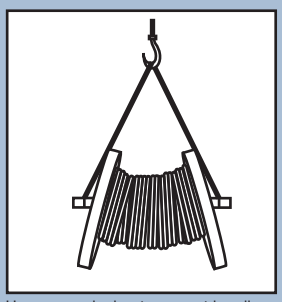


Always load with flanges on edge and chock and block securely.

NO

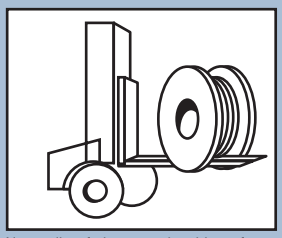


Do not lift by top flange. Cable or reel will be damaged

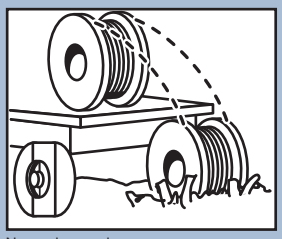


Use a spreader bar to prevent bending the reel flanges and mashing the cable.

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.

Prysmian Group

Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

Recommended Cable 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 Cable 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.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

Pre-Installation Instructions

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:

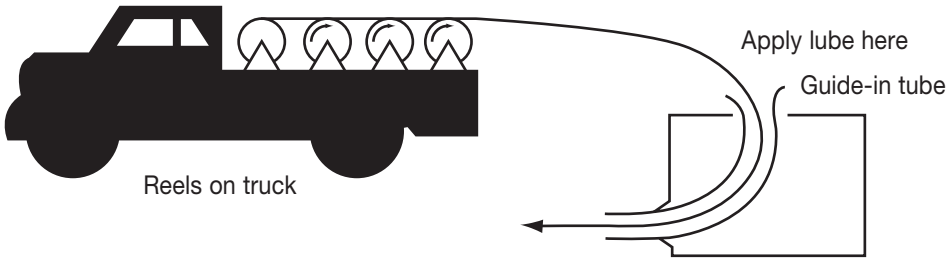
- ❑ 0-1/5/10 kip dynamometer
- ❑ basket grip pullers
- ❑ cable cutter
- ❑ cable end seals
- ❑ cable pulling lubricant
- ❑ cable tray bend sheaves
- ❑ cable tray rollers
- ❑ capstan-type puller
- ❑ diameter tape
- ❑ duct cleaning mandrels
- ❑ electric safety blankets and clamps
- ❑ extension cords and 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

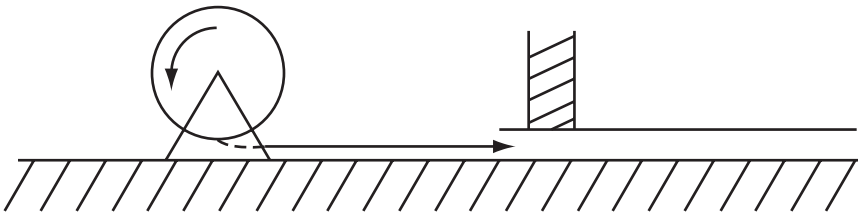
Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

Installation – Feed-In Setups

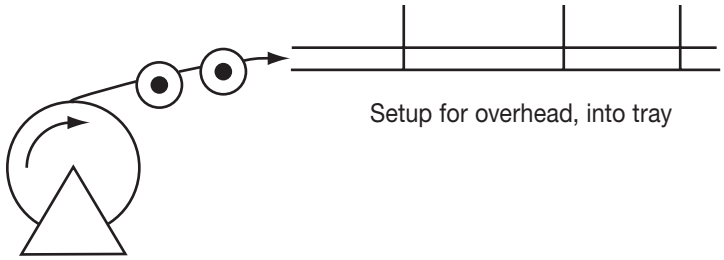
Cable Feed-In Setups

The following diagrams illustrate various cable feed-in setups:





Setup for duct close to floor



Setup for overhead, into tray

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

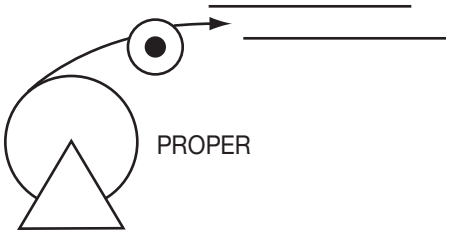


Figure 1

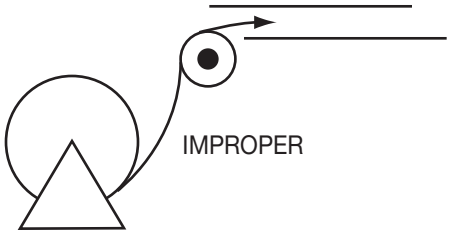


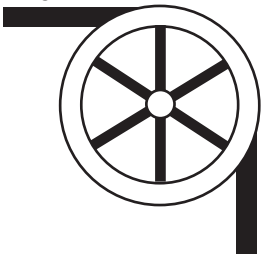
Figure 2

Installation – Feed-In Setups

Cable Feed-In Setups (continued)

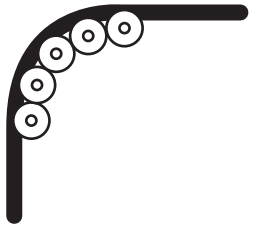
Single sheaves should only be used for GUIDING cables. Arrange multiple blocks to maintain bending radii whenever cable changes direction or elevation.

Single Sheave



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

Sheave Assembly



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).

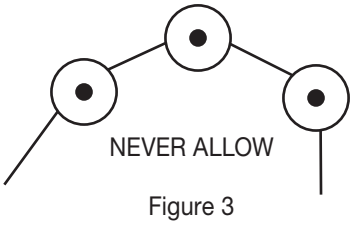
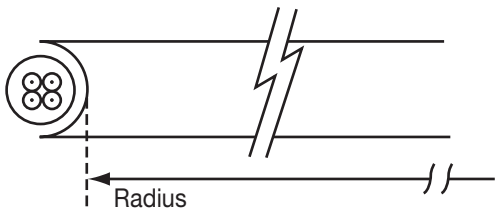


Figure 3

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.



Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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

The maximum allowable pulling tensions are for direct attachment to the conductor.
$T = 0.008 \times cmil \times n$, if $n \leq 3$
$T = 0.008 \times cmil \times n \times 0.8$, 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.

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

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.

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

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

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

Installation – Training and Bending Limitations

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
			MC[3]	7X		
		Shielded	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.

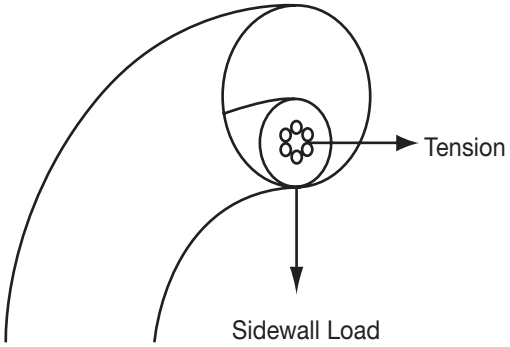
Installation – Maximum Sidewall Pressure

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.



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

Compatible Cable Pulling Lubricants:

American Polywater Corp.
- Polywater® J
- Polywater® LZ

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

CATALOG NUMBER INDEX

Prysmian Group

Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

NOTES

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

NOTES

Prysmian Group
Telephone: +1.859.572.8000
na.nuclear@prysmiangroup.com

ULTROL® 60+

ADVANCING NUCLEAR POWER

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 Group 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.*

Prysmian Group

na.nuclear@prysmiangroup.com
+1.859.572.8000

Prysmian Group
Green Initiative

A commitment to achieving industry-leading standards and responding proactively to environmental global issues.

ULTROL® 60+
ADVANCING NUCLEAR POWER

Global Reach

Prysmian Group serves customers through a global network of 108 manufacturing facilities in 50 countries and sales representatives and distribution centers worldwide. The Company is solely dedicated to the production of high-quality energy, industrial, specialty and communications wire and cable products. In addition to its breadth of product line and strong brand recognition, the Company offers competitive strengths in such areas as technology, manufacturing, distribution and logistics, and sales and customer service. This combination enables Prysmian Group to better serve its customers as they expand into new geographic markets.

Prysmian Group

Corporate Headquarters
4 Tesseneer Drive
Highland Heights,
Kentucky 41076-9753
U.S.A.
na.prysmiangroup.com

For more information, contact:
Prysmian Group
1600 West Main Street
Willimantic,
Connecticut 06226-1128
U.S.A.
na.nuclear@prysmiangroup.com

Telephone
+1.859.572.8000

Form No. INS-0146-0523
59041