ANHUI FEICHUN SPECIAL CABLE CO., LTD.

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XLPE INSULATED POWER CABLE - EXTRA HEAVY DUTY - TECHNICAL SPECIFICATION

4C × 150 MM²

4 Core XLPE Insulated Copper Power Cable - 1.1kV Flexible

XLPE 90°C | 150MM² COPPER | EXTRA HEAVY DUTY | HIGH PERFORMANCE

XLPE INSULATION TECHNOLOGY

Superior Thermal Performance | 90°C Operation | Enhanced Electrical Properties

Cores	Conductor Size	Material	Insulation	Voltage
4C	150mm²	Cu	XLPE	1.1kV

Max Current

~550A

CURRENT CARRYING CAPACITY (XLPE 90°C)

Direct Burial	Free Air	Cable Tray	In Conduit
510 A	560 A	535 A	485 A

🏆 XLPE INSULATION - SUPERIOR ADVANTAGES

Higher Operating Temperature

90°C continuous vs 70°C for PVC - 30% higher current capacity

Enhanced Short Circuit Rating

250°C vs 160°C for PVC - better fault current withstand

Superior Electrical Properties

Lower dielectric losses, higher insulation resistance, better power factor

Excellent Moisture Resistance

Outstanding water resistance and chemical stability

Extended Service Life

30-40 year design life vs 20-25 years for PVC

Better Thermal Aging

Maintains properties at elevated temperatures

Lower Voltage Drop

Higher current capacity means smaller cable sizes or longer runs

Environmental Resistance

Superior resistance to oils, chemicals, and harsh environments

1. GENERAL DESCRIPTION

This extra heavy duty 4 core power cable features 150mm² copper conductors with advanced XLPE (Cross-Linked Polyethylene) insulation, representing premium power transmission technology. Rated at 1.1kV with 90°C continuous operating temperature, this cable delivers exceptional current carrying capacity of 510-560A depending on installation method - approximately 30% higher than equivalent PVC insulated cables. The massive 150mm² conductor size combined with XLPE's superior thermal properties provides extremely low resistance (0.129 Ω/km), minimal voltage drop, and outstanding power transmission efficiency. With approximately 5,340 kg of copper per kilometer and total cable weight exceeding 10,000 kg/km, this cable is engineered for the most demanding applications including main transformer feeders, large motor connections (200+ kW), data center primary distribution, industrial substations, and major infrastructure projects. XLPE insulation offers superior electrical, thermal, and mechanical performance with extended service life (30-40 years), making it the preferred choice for critical, high-reliability, high-power installations where long-term performance and safety are paramount.

Parameter	Specification
Cable Designation	**4 Core × 150 MM² XLPE Insulated Copper Power Cable**
Number of Cores	**4 Cores**
Conductor Cross-Section	**150 mm² per core**
Rated Voltage U_0/U	**0.6/1.1 kV**
Conductor Material	Annealed Copper (Cu) - Class 2 Stranded
Conductor Type	Circular stranded (Flexible options available)
Insulation Material	**XLPE (Cross-Linked Polyethylene)**

Sheath Material	PVC or LSZH (Low Smoke Zero Halogen)
Maximum Operating Temperature	**90°C Continuous (XLPE)**
Emergency Overload Temperature	105°C (Limited duration)
Short Circuit Temperature	**250°C (Maximum 5 seconds)**
Application Class	Extra Heavy Duty Industrial Power Distribution

2. CABLE CONSTRUCTION

XLPE POWER CABLE STRUCTURE (8 Layers)

1. Conductor Core: Circular stranded annealed copper, 150mm² nominal per core (Class 2)

2. Conductor Screen: Semiconducting extruded compound (for XLPE)

3. XLPE INSULATION: Cross-linked polyethylene, 90°C rated, superior thermal and electrical properties

4. Insulation Screen: Strippable semiconducting compound

5. Core Assembly: Four insulated cores with polypropylene filler

6. Binding Tape: Non-woven tape to secure cores

7. Inner Sheath (optional): PVC separator or extruded layer

8. Outer Sheath: PVC or LSZH heavy-duty compound

Component	Material/Description	Technical Details
Conductor	Circular stranded annealed copper	Class 2 per IEC 60228, compacted
Conductor Construction	Multi-strand configuration	Approximately 37-61 strands per conductor
Copper Purity	Electrical grade copper	≥99.9% purity, annealed for flexibility

DC Resistance (20°C)	Maximum per conductor	≤0.129 Ω/km
Conductor Diameter	Nominal per core	Approximately 15.5 - 16.5 mm
Conductor Screen	Semiconducting compound	Extruded, bonded to XLPE
XLPE Insulation Thickness	**Cross-linked polyethylene**	1.4 - 1.8 mm nominal
XLPE Properties	Thermosetting material	Cross-linked molecular structure, cannot be re-melted
Insulation Screen	Strippable semiconducting layer	For stress control and termination
Core Colors	Standard identification	Brown, Black, Grey, Blue (or as specified)
Filler Material	Non-hygroscopic polypropylene	Maintains cable roundness
Sheath Thickness	PVC or LSZH	3.4 - 4.0 mm nominal
Overall Diameter	Approximate	75 - 85 mm
Approximate Weight	Per kilometer	10,200 - 11,500 kg/km
Copper Content	**Pure copper weight**	Approximately 5,340 kg/km (4 × 150mm²)

3. ELECTRICAL CHARACTERISTICS

Parameter	Value	Test Condition / Standard
Rated Voltage (U_0/U)	**0.6/1.1 kV**	AC 50/60 Hz
Maximum Conductor DC Resistance	0.129 Ω/km	At 20°C per IEC 60228
Current Capacity (Direct Burial)	**500 - 520 A**	Underground, 25°C soil, 90°C conductor
Current Capacity (Free Air)	**550 - 570 A**	Clipped direct, 30°C ambient, 90°C conductor
Current Capacity (Cable Tray)	525 - 545 A	Perforated tray, 30°C ambient
Current Capacity (In Conduit)	475 - 495 A	Enclosed conduit, 30°C ambient
AC Voltage Test	3.5 kV for 5 minutes	Between conductors and earth
Insulation Resistance	**≥100 MΩ·km**	At 20°C (XLPE superior to PVC)

Maximum Operating Temperature	**90°C (XLPE)**	Continuous operation
Emergency Overload Temperature	105°C	Limited duration (100 hours/year max)
Short Circuit Temperature	**250°C (XLPE)**	Maximum 5 seconds duration
Voltage Drop	Approx. 0.28 mV/A/m	At power factor 0.8, 90°C conductor
Power Capacity (400V, 3-Phase)	**Approximately 350-380 kW**	At 540A, 400V, 3-phase, 0.8 PF
Power Capacity (230V, Single-Phase)	Approximately 124 kW	At 540A, 230V, single-phase
Impedance (Z)	Approx. 0.131 Ω/km	At 50 Hz, 90°C
Reactance (X)	Approx. 0.075 Ω/km	At 50 Hz
Short Circuit Current (1 sec)	Approx. 70.7 kA	XLPE, 250°C final temperature
Dielectric Loss Factor (tan δ)	Very low	XLPE has excellent dielectric properties
Capacitance	Approx. 0.35 µF/km	Core to core

4. MECHANICAL PROPERTIES & INSTALLATION

Parameter	Specification	Notes
Conductor Class	Class 2 - Stranded	Per IEC 60228 (Class 5 flexible available)
Minimum Bending Radius (Installation)	15 × Overall Diameter (≥1,200 mm)	During installation
Minimum Bending Radius (Fixed)	12 × Overall Diameter (≥960 mm)	After installation
Tensile Strength (XLPE)	≥12.2 N/mm²	Superior to PVC
Elongation at Break (XLPE)	≥200%	Before thermal aging
Installation Temperature	≥0°C	Preheating required below 0°C
Operating Temperature Range	**-20°C to +90°C (XLPE)**	Wider range than PVC
Moisture Resistance	**Excellent (XLPE)**	Superior to PVC, no water treeing
Chemical Resistance	Excellent	Resistant to oils, acids, alkalis

Flame Retardant	IEC 60332-1	Single vertical wire flame test
Cable Weight Handling	**VERY HEAVY - Equipment Required**	Approximately 10-11 kg per meter
Maximum Pulling Tension	Approx. 30,000 N	50 N/mm² of conductor area
Design Life (XLPE)	**30-40 years**	vs 20-25 years for PVC

5. TYPICAL APPLICATIONS

Large Motor Connections

Power supply to very large motors 200-400 kW (270-535 HP) in industrial facilities

Transformer Secondary Feeders

Main distribution from large transformers (1-2 MVA) to switchgear and distribution boards

Data Center Power Distribution

Primary power feeders for mega data centers requiring maximum reliability

Industrial Substations

Main power distribution in heavy industrial facilities and processing plants

High-Rise Buildings

Main riser cables for tall buildings, hotels, and commercial towers

Hospital Main Feeders

Critical power distribution where reliability and long life are essential

Airport Infrastructure

Main power distribution for terminals, hangars, and ground support systems

Renewable Energy

Solar farms and wind farms - power collection and distribution systems

Manufacturing Plants

Heavy industrial power distribution in automotive, steel, and chemical plants

Mining Operations

Surface mining main power distribution for large equipment and processing

Water Treatment Plants

Power distribution in harsh, humid environments requiring moisture resistance

Petrochemical Facilities

Main power feeders in refineries and chemical processing plants

Why Choose XLPE for Heavy Duty Applications: 30% higher current capacity than PVC | Extended 30-40 year service life | Superior moisture and chemical resistance | Better electrical properties - lower losses | Higher short circuit withstand (250°C vs 160°C) | Wider operating temperature range | Reduced voltage drop means longer cable runs possible | Lower total cost of ownership despite higher initial cost | Preferred for critical, high-reliability applications | Better environmental performance

6. LOAD CAPACITY & POWER TRANSMISSION

Application Example	Configuration	Power Rating
Very Large Industrial Motor	400V, 3-phase	200-350 kW (270-470 HP)
Large Compressor System	400V, 3-phase	250-375 kW
Transformer Secondary (1.5 MVA)	400V, 3-phase distribution	Main feeder capacity

Data Center Main Distribution	400V, 3-phase	Up to 380 kW per cable set
Industrial Plant Main Feeder	400V, 3-phase	300-375 kW
Large HVAC Chiller System	400V, 3-phase	250-350 kW
High-Rise Building Riser	400V, 3-phase	Main distribution up to 380 kW
Mining Processing Equipment	400V, 3-phase	Large crushers, conveyors 250-375 kW

7. XLPE vs PVC COMPARISON

Property	XLPE (This Cable)	PVC Equivalent	Advantage
Max Operating Temperature	**90°C**	70°C	29% higher for XLPE
Current Capacity (Example)	**540 A**	420 A	29% higher for XLPE
Short Circuit Temperature	**250°C**	160°C	56% higher for XLPE
Insulation Resistance	**≥100 MΩ·km**	≥20 MΩ·km	5× better for XLPE
Design Service Life	**30-40 years**	20-25 years	50% longer for XLPE
Moisture Resistance	**Excellent**	Fair	Much better for XLPE
Dielectric Loss	**Very Low**	Moderate	Lower losses for XLPE
Operating Temp Range	**-20°C to +90°C**	-15°C to +70°C	Wider range for XLPE

8. TECHNICAL STANDARDS & COMPLIANCE

Standard	Description
IEC 60502-1	Power cables with extruded insulation for rated voltages from 1 kV to 30 kV - XLPE cables
IEC 60228	Conductors of insulated cables - Class 2 stranded conductors specification
IEC 60332-1-2	Tests on electric cables under fire conditions - Single vertical wire flame test
IEC 60364-5-52	Electrical installations of buildings - Selection and erection of electrical equipment
IEC 60811	Electric and optical fibre cables - Test methods for non-metallic materials - XLPE testing

BS 5467	Electric cables - Thermosetting insulated cables for rated voltages up to 0.6/1kV (Reference)
BS 7671	Requirements for Electrical Installations - UK Wiring Regulations (Reference)
GB/T 12706.1	Chinese National Standard for XLPE insulated power cables 0.6/1kV to 26/35kV
NEC Article 310	US National Electrical Code - Conductors for general wiring (Reference)
RoHS Directive 2011/65/EU	Restriction of Hazardous Substances - Full environmental compliance
CE Marking	European Conformity marking (where applicable)

9. INSTALLATION GUIDELINES

Installation Parameter	Requirement / Specification
Installation Team	**MINIMUM 4-6 qualified electricians - specialized training required**
Equipment Required	Heavy-duty cable drum stand, motorized winch, cable rollers, lifting equipment
Drum Handling	**Forklift or crane MANDATORY - drums exceed 2,500 kg**
Support Spacing (Vertical)	Maximum 0.3 - 0.4 meters due to extreme weight
Support Spacing (Horizontal)	Maximum 0.8 - 1.0 meters on heavy-duty cable tray
Cable Tray Requirements	Heavy-duty tray, minimum 300mm wide, rated for 30 kg/meter
Pulling Force	Maximum 30,000 N - Use motorized winch with monitoring
Maximum Pull Length	25-35 meters - Use intermediate pull boxes for longer runs
Cable Termination	Heavy-duty compression lugs rated for 150mm² (M20 or M24 stud)
Crimping Equipment	**Hydraulic crimping tool MANDATORY - 150mm² dies required**
XLPE Termination Kit	Use heat-shrink or cold-shrink termination kits designed for XLPE
Screen Termination	Properly strip and terminate semiconducting screens per manufacturer instructions
Circuit Protection	MCB/MCCB rated at 500-630A (based on installation and load)

Testing Before Energization	Insulation resistance test (min 1000V DC), continuity, phase sequence

Critical Installation Requirements:

- **Extreme Weight:** Cable weighs 10-11 kg/meter - proper equipment and handling procedures MANDATORY
- **XLPE Termination:** Use proper termination kits - incorrect termination can cause insulation failure
- **Screen Handling:** Semiconducting screens must be properly stripped and terminated - critical for XLPE
- **Bending Radius:** Do NOT exceed minimum bending radius (1,200mm) - can damage insulation
- **Professional Installation:** XLPE cables require specialized knowledge and techniques
- **Quality Tools:** Use calibrated hydraulic crimping tools and proper torque wrenches
- Installation must comply with IEC 60364, NEC, or local electrical codes
- Professional engineering design and supervision recommended for critical applications

10. QUALITY ASSURANCE & TESTING

Comprehensive testing program for XLPE cables:

- **Conductor DC resistance test:** Verified ≤0.129 Ω/km at 20°C
- **High voltage withstand test:** 3.5 kV AC for 5 minutes
- **Insulation resistance test:** Minimum 100 MΩ·km at 20°C
- **Hot set test:** XLPE specific - measures permanent deformation at 200°C
- **Tensile strength and elongation:** Before and after thermal aging
- **Thermal aging test:** 168 hours at 135°C for XLPE
- **Dimensional verification:** All layers measured and verified
- **Partial discharge test:** Critical for XLPE quality verification
- **Water absorption test:** Verifies moisture resistance
- **Fire performance test:** IEC 60332-1-2 flame test
- **Screen adhesion test:** Bonding quality of semiconducting screens
- **Complete visual inspection:** Construction and marking verification

Quality Certification: Manufactured under ISO 9001:2015 quality management system with XLPE-specific quality controls. Complete documentation package includes: Type test reports with XLPE-specific tests, Routine test certificates, Certificate of conformity, Material declarations (RoHS), XLPE compound specifications, Installation and termination guidelines. Third-party testing available. Factory acceptance testing (FAT) recommended for large projects. Full batch traceability maintained.

11. PACKAGING, STORAGE & DELIVERY

Item	Details

Standard Lengths	100m, 200m, 250m, 300m (limited by drum capacity and weight)
Maximum Length per Drum	300m per drum (approx. 3,000-3,400 kg cable weight)
Packaging Type	**Heavy-duty steel cable drum - reinforced construction**
Gross Weight (300m)	Approximately 3,500-4,000 kg including drum
Cable Marking	Sequential meter marking every 1 meter, includes "XLPE" designation
Storage Temperature	-5°C to +35°C (XLPE more tolerant than PVC)
Storage Duration	**24 months (XLPE has better storage stability than PVC)**
Protection Requirements	Protect from direct sunlight, moisture, and mechanical damage
Handling Equipment	**CRANE or forklift REQUIRED - minimum 4-ton capacity**
Production Lead Time	30-45 working days (XLPE requires cross-linking process)
Minimum Order Quantity	500 meters (can be multiple drums)

Important Information:

- This specification is for reference and subject to technical modifications
- XLPE cables offer superior performance but require specialized installation techniques
- Total cost of ownership is lower than PVC despite higher initial cost due to longer life and higher capacity
- Professional engineering design MANDATORY for installations over 100 kW
- Use only XLPE-compatible termination kits and accessories
- Installation by qualified, experienced electricians essential
- Appropriate circuit protection and system design required
- For special requirements or technical support, contact our engineering department
- Custom specifications available: Different sheath materials, special colors, armoring options

FEICHUN SPECIAL CABLES

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