ANHUI FEICHUN SPECIAL CABLE CO., LTD.

安徽飞纯特种电缆有限公司

HEAVY DUTY FLEXIBLE ELECTRIC CABLE - TECHNICAL SPECIFICATION

4 × 70 MM²

4 Core Copper Flexible Electric Cable - 1.1kV Insulation

HEAVY DUTY | HIGH CURRENT | FLEXIBLE CONSTRUCTION

⚡ HEAVY DUTY POWER CABLE

High Current Carrying Capacity | Large Cross-Section | Industrial Grade

Number of Cores	Conductor Size	Rated Voltage	Material	Flexibility
4	70 mm²	1.1 kV	Cu	Class 5

⚡ CURRENT CARRYING CAPACITY

Direct Burial	In Air (Clipped)	In Conduit	On Cable Tray
225 A	255 A	215 A	240 A

1. GENERAL DESCRIPTION

This heavy-duty 4 core copper cable features a large 70mm² cross-sectional area per conductor, designed for high current power transmission and distribution applications. The flexible construction (Class 5) makes it suitable for installations requiring movement while maintaining excellent electrical performance. With 1.1kV insulation rating, this cable is ideal for industrial power distribution, large motor connections, transformer feeders, and main power supply circuits. The substantial copper content ensures low resistance, minimal voltage drop, and efficient power delivery for demanding electrical systems.

Parameter	Specification
Cable Designation	**4 Core × 70 MM² Flexible Copper Cable**

Number of Cores	**4 Cores**
Conductor Cross-Section	**70 mm² per core**
Rated Voltage U₀/U	**0.6/1.1 kV**
Conductor Material	Annealed Bare Copper (Cu) - High Purity
Conductor Type	Class 5 Flexible Stranded (Fine Wire)
Insulation Material	Cross-Linked Polyethylene (XLPE) or PVC
Sheath Material	Polyvinyl Chloride (PVC) or Thermoplastic Elastomer (TPE)
Flexibility Grade	Class 5 - High Flexibility
Application Class	Heavy Duty Industrial Power Cable

2. CABLE CONSTRUCTION

CABLE STRUCTURE (Core to Outer Layer)

1. **Conductor Core:** Multi-strand fine copper wires (Class 5), 70mm² nominal cross-section per core

2. **Conductor Insulation:** XLPE or PVC insulation with color identification

3. **Core Assembly:** Four insulated cores twisted or laid in parallel configuration

4. **Filler Material:** Non-hygroscopic polypropylene or jute filler for roundness

5. **Binding Tape:** Non-woven tape to hold cores together

6. **Inner Sheath (Optional):** Thin PVC separator layer

7. **Outer Sheath:** Heavy-duty PVC or TPE compound (Black standard)

Component	Material/Description	Technical Details
Conductor	Class 5 flexible stranded copper	Per IEC 60228, fine wire diameter ≤0.41mm
Number of Strands	Multiple fine copper wires	Approximately 550+ strands per conductor

Copper Purity	Annealed copper	≥99.9% purity, high conductivity
DC Resistance	Maximum at 20°C	≤0.272 Ω/km per conductor
Conductor Diameter	Nominal	Approximately 10.5 - 11.0 mm per core
Insulation Thickness	XLPE or PVC Type	1.0 - 1.4 mm nominal
Core Colors	Standard identification	Brown, Black, Grey, Blue (or custom)
Sheath Thickness	PVC/TPE outer protection	2.2 - 2.8 mm nominal
Overall Diameter	Approximate	36 - 42 mm (depending on construction)
Approximate Weight	Per kilometer	2,800 - 3,200 kg/km
Copper Content	Pure copper weight	Approximately 2,480 kg/km (4 × 70mm²)

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	0.272 Ω/km	At 20°C per IEC 60228
Current Carrying Capacity (Direct Burial)	**220 - 230 A**	Underground, 25°C soil temperature
Current Carrying Capacity (Clipped to Wall)	**250 - 260 A**	Free air, 30°C ambient
Current Carrying Capacity (Cable Tray)	**235 - 245 A**	Perforated tray, 30°C ambient
Current Carrying Capacity (In Conduit)	210 - 220 A	Enclosed conduit, 30°C ambient
AC Voltage Test	3.5 kV for 5 minutes	Between conductors and earth
Insulation Resistance	≥50 MΩ·km	At 20°C
Maximum Operating Temperature	70°C (PVC) / 90°C (XLPE)	Continuous operation
Short Circuit Temperature	160°C (PVC) / 250°C (XLPE)	Maximum 5 seconds duration
Voltage Drop	Approx. 0.60 V/A/km	At power factor 0.8, 90°C
Maximum Power Transmission	Approximately 150-170 kW	At rated current, 400V 3-phase

Inductance	Approx. 0.08 mH/km	AC frequency 50 Hz
Capacitance	Approx. 0.25 µF/km	Core to core

4. MECHANICAL PROPERTIES

Parameter	Specification	Notes
Flexibility Class	**Class 5 - High Flexibility**	Per IEC 60228, despite large size
Minimum Bending Radius (Moving)	10 × Overall Diameter (≥400 mm)	For flexible applications
Minimum Bending Radius (Fixed)	8 × Overall Diameter (≥320 mm)	For stationary installation
Tensile Strength	≥12.5 N/mm²	Insulation material
Elongation at Break	≥150%	Before thermal aging
Installation Temperature	≥0°C	May require preheating below 0°C
Operating Temperature Range	-15°C to +70°C (PVC) -20°C to +90°C (XLPE)	Ambient conditions
Maximum Pulling Tension	50 N/mm² of conductor area	During installation (14,000N total)
Flame Retardant	IEC 60332-1-2	Single vertical wire flame test
Cable Weight (Handling)	Heavy - Requires Equipment	Approximately 3 kg per meter

5. APPLICATIONS

Main Power Distribution

Primary power feeders for industrial facilities, commercial buildings, and distribution boards

Large Motor Connections

Power supply to high-power motors (75-160 kW), pumps, compressors, and heavy machinery

Transformer Feeders

Secondary distribution from transformers to main switchboards and substations

Industrial Plants

Power distribution in manufacturing plants, refineries, chemical facilities, and processing plants

Mining Operations

Heavy-duty power supply for mining equipment, excavators, and processing machinery

Marine & Offshore

Shipboard power distribution, offshore platforms, and port facilities

Data Centers

Main power feeds to UPS systems, PDUs, and high-density server racks

Construction Sites

Temporary and permanent power distribution for large construction projects

Generator Connections

Power cables from standby generators to automatic transfer switches and

		distribution panels

Key Advantages: Very high current carrying capacity (220-260A) | Low electrical resistance (0.272 Ω/km) | Minimal voltage drop | Excellent flexibility for large cable | High mechanical strength | Suitable for heavy industrial loads | Cost-effective for high power applications | Long service life | Available with XLPE insulation for 90°C operation

6. TECHNICAL STANDARDS & COMPLIANCE

Standard	Description
IEC 60502-1	Power cables with extruded insulation for rated voltages from 1 kV to 30 kV
IEC 60228	Conductors of insulated cables - Class 5 flexible conductors
IEC 60332-1-2	Tests on electric cables under fire conditions - Single vertical wire flame test
IEC 61034	Measurement of smoke density of cables burning under defined conditions
IEC 60364-5-52	Electrical installations of buildings - Selection and erection of electrical equipment
GB/T 12706	Chinese National Standard for power cables (0.6/1kV to 26/35kV)
BS 7671	UK Wiring Regulations (Reference for installation practices)
NEC Article 310	US National Electrical Code - Conductors for general wiring (Reference)
RoHS Compliant	Restriction of Hazardous Substances - Environmental compliance
CE Marking	European Conformity (where applicable)

7. INSTALLATION GUIDELINES

Installation Parameter	Requirement
Cable Handling	**Requires mechanical equipment - Cable is very heavy (3 kg/m)**
Drum Size	Large heavy-duty drums required due to cable weight and diameter
Minimum Crew Size	3-4 persons for safe installation
Cable Support Spacing (Vertical)	Maximum 0.3 - 0.4 meters due to cable weight
Cable Support Spacing (Horizontal)	Maximum 0.8 - 1.0 meters on cable tray
Cable Tray Width	Minimum 150mm width to accommodate cable diameter

Conduit Size	Minimum 100mm (4") internal diameter if enclosed
Pulling Force	Maximum 14,000 N total - Use cable pulling equipment and lubricant
Maximum Pulling Length	30-50 meters depending on route (use intermediate pull boxes)
Cable Termination	Use heavy-duty cable lugs rated for 70mm² (M12 or larger stud)
Compression Tools	Hydraulic crimping tools required for proper termination
Cable Glands	Use industrial glands size M63 or larger
Earth Bonding	Proper earthing required - Follow local electrical codes
Testing After Installation	Insulation resistance test, continuity test, phase rotation test

Critical Installation Warnings:

- **HEAVY CABLE:** This cable weighs approximately 3 kg per meter. Use proper lifting equipment and mechanical aids for installation
- Never attempt to manually lift or pull long lengths - risk of injury
- Do not exceed minimum bending radius (400mm) - can damage conductor strands
- Use cable rollers and pulling equipment for horizontal runs
- Ensure adequate support - insufficient support can cause cable deformation
- Always use hydraulic crimping tools - manual tools inadequate for 70mm² conductors
- Verify all connections are tight - loose connections cause overheating at high currents
- Follow manufacturer's torque specifications for cable lugs and terminals
- Professional installation by qualified, experienced electricians mandatory
- Follow all local electrical codes and safety regulations

8. CURRENT DERATING FACTORS

Current carrying capacity must be adjusted based on installation conditions:

Installation Condition	Derating Factor	Example (Base 250A)
Single cable in free air (reference)	1.00	250 A
Two cables bunched together	0.80	200 A
Three cables bunched together	0.70	175 A
Four or more cables bunched	0.65	163 A
Ambient temperature 35°C	0.94	235 A
Ambient temperature 40°C	0.87	218 A

Ambient temperature 45°C	0.79	198 A
Buried in ground (high thermal resistivity)	0.85	213 A

Important: Multiple derating factors should be multiplied together. For example: 3 cables bunched (0.70) at 40°C ambient (0.87) = 0.70 × 0.87 = 0.61 overall factor. Always consult IEC 60364-5-52 or local codes for specific installation conditions.

9. QUALITY ASSURANCE & TESTING

Every production run undergoes rigorous quality control:

- **Conductor resistance test:** Verified to be ≤0.272 Ω/km at 20°C
- **High voltage test:** 3.5 kV AC for 5 minutes between conductors and water
- **Insulation resistance test:** Minimum 50 MΩ·km at 20°C
- **Dimensional verification:** Conductor diameter, insulation thickness, overall diameter
- **Strand count verification:** Ensure proper number of fine copper strands
- **Flexibility test:** Bending test per IEC 60228 Class 5 requirements
- **Mechanical strength test:** Tensile and elongation testing of insulation
- **Thermal aging test:** Accelerated aging to verify long-term performance
- **Fire performance test:** Flame propagation test per IEC 60332-1-2
- **Copper purity test:** Conductivity measurement (≥99.9% IACS)
- **Visual inspection:** Complete inspection of construction and marking

Quality Certification: All cables manufactured under ISO 9001:2015 quality management system. Complete type test reports, routine test certificates, and certificates of conformity provided. Third-party testing available upon request. Factory acceptance testing (FAT) can be arranged for large projects.

10. PACKAGING, STORAGE & DELIVERY

Item	Details
Standard Length	100m, 200m, 300m, or customized (weight limitations apply)
Maximum Length per Drum	Typically 300-500m depending on drum size and weight limits
Packaging Type	Heavy-duty steel or reinforced wooden drums (large diameter required)
Typical Drum Weight	300-1,500 kg depending on cable length (cable alone: 3 kg/m)
Cable Marking	Sequential meter marking every 1 meter on outer sheath
Marking Information	Manufacturer, cable specification, voltage rating, date code, footage

Documentation	Type test report, routine test certificate, certificate of conformity, material declaration, installation guide
Storage Conditions	Store drums upright on firm, level ground in covered, dry area
Storage Temperature	-5°C to +35°C (protect from extreme temperatures)
Shelf Life	24 months under proper storage conditions
Handling Equipment	Forklift or crane required for drum handling - Very heavy
Transportation	Secure drums properly during transport to prevent rolling or shifting
Lead Time	25-40 working days after order confirmation (subject to quantity)
Minimum Order Quantity	500 meters (negotiable for large projects)

11. TECHNICAL CALCULATIONS & DESIGN DATA

Parameter	Value	Notes
Impedance (Z)	Approx. 0.276 Ω/km	At 50 Hz, 90°C operating temperature
Reactance (X)	Approx. 0.078 Ω/km	At 50 Hz
Power Factor Angle	cos φ = 0.8 (typical)	For industrial loads
Short Circuit Current (1 sec)	Approx. 12.6 kA	For PVC insulation, 160°C final temp
Short Circuit Current (1 sec)	Approx. 19.8 kA	For XLPE insulation, 250°C final temp
Maximum Cable Run (2% drop)	Approx. 180 meters	At 250A, 400V, 3-phase, 0.8 PF
Maximum Cable Run (5% drop)	Approx. 450 meters	At 250A, 400V, 3-phase, 0.8 PF
Thermal Time Constant	Approx. 45-55 minutes	Time to reach 63% of final temperature

Design Note: Always perform voltage drop calculations for your specific installation. Longer cable runs may require larger conductor sizes to maintain acceptable voltage drop. Consult electrical engineer for critical applications.

Important Technical Information:

- This specification is for reference purposes and subject to technical modifications
- Custom specifications available: LSZH (Low Smoke Zero Halogen) compounds, different insulation materials, special colors
- For installations exceeding 250A continuous current, consider ventilation and heat dissipation

- Parallel cable runs may be required for very high current applications
- Always use appropriately rated circuit protection devices (circuit breakers, fuses)
- Installation must comply with IEC 60364, NEC, or local electrical codes
- Professional engineering design recommended for main distribution systems
- Detailed load calculations, fault current analysis, and voltage drop studies should be performed
- For specialized applications (hazardous areas, marine, nuclear), contact technical department
- Proper system earthing and grounding required per applicable standards

FEICHUN SPECIAL CABLES

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