EpN 53 Flexible Rubber Mining Cable

Methane-Safe Individual Conductor Protection System

INDIVIDUAL CORE PROTECTION | BRAIDED CONDUCTOR SHIELDING | METHANE SAFE

Individual Protection System Specifications

Standards: SRPS N.C5.353 & DIN VDE 0250-812 | **Voltage Rating:** 0.6/1 kV | **Test Voltage:** 2.5 kV | **Protection:** Individual conductor braided shielding | **Environment:** Methane & coal dust explosion hazards

Advanced Individual Conductor Protection Overview

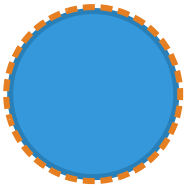
The EpN 53 flexible rubber mining cable represents a specialized approach to conductor protection for underground coal mining operations in methane-hazardous environments. This professional-grade cable features innovative individual conductor braided protection, where each core is surrounded by its own tinned copper wire braid, providing unprecedented core-level safety and electromagnetic protection for critical mining applications.

Engineered to meet SRPS N.C5.353 and DIN VDE 0250-812 standards, the EpN 53 addresses mining applications requiring enhanced conductor-level protection against electromagnetic interference, mechanical damage, and electrical faults. The individual braided protection system ensures that each conductor maintains its integrity independently, providing superior reliability for both power and signal/control applications in explosive mining environments.

Individual Braided Protection Technology

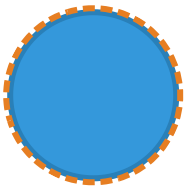
Revolutionary Individual Conductor Shielding

The EpN 53 employs advanced individual conductor protection where each core receives its own dedicated tinned copper wire braid shield:



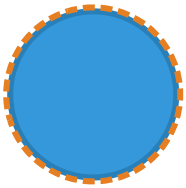
Core 1

Individual Braid Protection



Core 2

Independent Shielding



Core 3

Enhanced Protection

Individual Protection System Components:

- **Core Conductors:** Tinned copper Class 5 stranding for corrosion resistance and flexibility
- **Individual EPR Insulation:** GI2/3GI3 grade rubber compound for each conductor
- **Individual Braided Shield:** Tinned copper wire braid surrounding each insulated core
- **Concentric Core Assembly:** Protected cores arranged in optimized layers
- **Inner Sheath:** Synthetic rubber (GP5/GM1b) for comprehensive assembly protection
- **Outer Sheath:** Color-coded polychloroprene (GP7/5GM5) for application identification

Advantages of Individual Conductor Protection

The individual braided protection system provides multiple technical and safety advantages:

- **Independent Core Protection:** Each conductor maintains individual electromagnetic shielding
- **Enhanced Fault Isolation:** Core-level protection prevents cross-conductor interference
- **Superior EMI Shielding:** Individual braids provide optimized electromagnetic protection
- **Mechanical Core Support:** Braided shields provide additional mechanical strength
- **Improved Signal Integrity:** Individual shielding eliminates crosstalk between conductors
- **Enhanced Reliability:** Independent protection systems increase overall cable reliability

Dual Application Color Coding System

Power Cables - Yellow Sheath

Power distribution cables for mining equipment, motors, and electrical systems are identified with yellow polychloroprene sheath for immediate recognition in underground environments.

Signal & Control Cables - Grey Sheath

Control, instrumentation, communication, and signal cables utilize grey sheath coloring to prevent confusion with power circuits and ensure proper system integration.

EpN 53 Individual Protection Configurations

Construction	Cores	Cross-Section/Protection (mm^2)	Diameter (mm)	Mass (kg/km)	Application Category
3x2.5/2.5	3	2.5/2.5	18	384	Light Equipment
3x4/4	3	4/4	20	560	Medium Power/Control
3x6/6	3	6/6	24	730	Standard Mining Equipment
3x10/10	3	10/10	25	1045	High Power Systems

Construction	Cores	Cross-Section/Protection (mm^2)	Diameter (mm)	Mass (kg/km)	Application Category
3x16/16	3	16/16	30	1542	Heavy Power Equipment
3x25/16	3	25/16	33	1784	High-Power Mining Systems
3x35/16	3	35/16	38	2351	Heavy-Duty Power Distribution
3x50/25	3	50/25	47	3345	Critical Power Systems
3x70/35	3	70/35	51	4563	Maximum Power Applications
4x2.5/2.5	4	2.5/2.5	20	511	Control Systems
4x4/4	4	4/4	21	652	Advanced Control Equipment
4x6/6	4	6/6	25	1034	Multi-Phase Control
4x10/10	4	10/10	29	1414	High-Power Control Systems
5x2.5/2.5	5	2.5/2.5	22	645	Complex Control Systems
5x4/4	5	4/4	23	790	Multi-Channel Control
5x10/10	5	10/10	28	1130	Advanced Multi-Phase Systems

Note: Format shows conductor cross-section/individual braid protection cross-section in mm^2. Color coding indicates 3-core (blue), 4-core (orange), and 5-core (purple) configurations.

Enhanced Methane-Safe Performance

Ultimate Explosion Safety

Methane Resistance: Certified safe operation
Coal Dust Protection: Individual core isolation
Flame Retardant: IEC 60332-1 compliant
Core-Level Safety: Independent protection systems

Individual Protection System

Core Shielding: Individual tinned copper braids
EMI Protection: Independent electromagnetic shielding
Fault Isolation: Core-level protection
Signal Integrity: Eliminated crosstalk

Electrical Performance

Nominal Voltage: 0.6/1 kV (U_0/U)
Test Voltage: 2.5 kV
Frequency Rating: 50/60 Hz
Conductor Class: 5 per IEC 60228

Environmental Resistance

Operating Temperature: -25°C to +90°C
Installation Temperature: -30°C to +40°C
Short Circuit: +250°C (5 seconds)
Oil Resistance: DIN VDE 0472-803

Mechanical Properties

Minimum Bend Radius: 5 × cable diameter
Tensile Strength: 15 N/mm^2 (static)

Flexibility: Class 5 stranding
Individual Support: Braided core reinforcement

Advanced Construction

Conductors: Tinned copper Class 5
Individual Protection: Copper wire braids
Insulation: EPR rubber GI2/3GI3
Sheath System: Color-coded polychloroprene

Specialized Underground Coal Mining Applications

Enhanced Protection Mining Operations

Sensitive Control Systems

Mining equipment with sensitive electronic control systems, programmable logic controllers (PLCs), and precision instrumentation benefit from the individual conductor shielding that eliminates electromagnetic interference between conductors. The core-level protection ensures signal integrity for critical control circuits.

High-Interference Environments

Mining operations with high electromagnetic interference from heavy electrical equipment, variable frequency drives, and power electronics require cables with superior EMI protection. The individual braided shields provide optimal isolation for each conductor.

Critical Power Distribution

Essential power systems for life-safety equipment, emergency lighting, and ventilation controls require cables with enhanced reliability. The individual conductor protection ensures that a fault in one core doesn't compromise the integrity of other conductors.

Precision Monitoring Systems

Gas monitoring equipment, safety sensors, and environmental monitoring systems require cables with superior signal integrity. The individual conductor shielding eliminates crosstalk that could compromise sensitive monitoring data.

Advanced Mining Equipment

Sophisticated mining machinery with multiple control circuits, feedback systems, and communication requirements benefit from the enhanced conductor isolation provided by individual braided protection.

Dual-Purpose Installations

Mining operations requiring both power and control capabilities in the same cable run benefit from the color-coded system (yellow for power, grey for control) combined with individual conductor protection for maximum versatility.

Enhanced Safety Compliance and Installation

⚠ **Critical Safety Notice:** This cable is designed exclusively for underground coal mining operations with methane and coal dust explosion hazards where enhanced conductor-level protection is required. Installation must comply with local mining safety regulations and be performed only by certified mining electricians with individual protection system training.

Advanced Regulatory Compliance

The EpN 53 meets enhanced mining safety requirements:

- **SRPS N.C5.353:** Enhanced Serbian standard for mining cables with individual protection systems
- **DIN VDE 0250-812:** German standard for rubber-sheathed mining cables
- **IEC 60332-1:** International flame retardancy testing for explosive environments
- **DIN VDE 0472-803:** Oil resistance testing methodology for mining applications
- **Individual Shield Testing:** Verification of each conductor's braided protection system

Individual Protection Installation Requirements

The individual braided protection system requires specialized installation practices:

- **Individual Shield Termination:** Proper termination of each conductor's braided shield
- **Core-Level Testing:** Individual testing of each conductor and its protection system

- **EMI Optimization:** Proper cable routing for maximum electromagnetic protection
- **Color Code Compliance:** Consistent application of yellow (power) and grey (control) coding
- **Shield Continuity:** Verification of braided shield integrity for each conductor
- **Individual Grounding:** Proper grounding techniques for each conductor's shield

Comprehensive Individual Protection Testing

Every EpN 53 cable undergoes rigorous individual conductor testing to ensure compliance with enhanced mining safety standards:

- **Individual High Voltage Testing:** 2.5 kV test voltage verification for each conductor
- **Individual Shield Testing:** Verification of each conductor's braided protection integrity
- **Core-Level Insulation Testing:** Individual insulation resistance measurement for each conductor
- **EMI Shielding Effectiveness:** Testing of electromagnetic interference protection for each core
- **Individual Conductor Continuity:** Verification of each conductor and its protection system
- **Crosstalk Elimination:** Testing for signal interference between individually protected conductors
- **Environmental Stress Testing:** Individual conductor performance under mining conditions
- **Flame Retardancy:** IEC 60332-1 testing with individual protection system
- **Oil Resistance:** DIN VDE 0472-803 Method A testing for all components
- **Explosion Safety:** Comprehensive methane atmosphere safety verification

飞纯电缆

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