

Technical Specification

For the procurement of a 3-core XLPE 185 mm², 6.35/11 kV, Steel Wire Armored (SWA), underground power cable (500 m), the specification should require compliance with applicable SANS, IEC, and utility standards, together with factory and site acceptance testing before the cable is accepted into service.

Cable Description

Type: XLPE Insulated, PVC Bedded, Steel Wire Armored (SWA), PVC Sheathed Underground Cable

Number of cores: 3

Conductor size: 185 mm²

Conductor material: Stranded Copper (Class 2) (unless aluminium is specifically required)

Rated voltage: 6.35/11 kV (Um = 12 kV)

Length: 500 m

Installation: Direct buried underground or ducts

Maximum conductor operating temperature:

- 90°C continuous
- 130°C emergency overload
- 250°C short circuit (5 seconds)

Applicable Standards

The supplied cable shall comply with the latest editions of:

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Western Precinct, Aviation Park, O.R. Tambo International Airport, 1 Jones Road, Kempton Park, Gauteng,
South Africa, 1632
P O Box 75480, Gardenvue, Gauteng, South Africa, 2047
www.airports.co.za

- SANS 97 – Electric Cables
- SANS/IEC 60502-2 – Power cables with extruded insulation from 6 kV up to 30 kV
- IEC 60228 – Conductors of insulated cables
- IEC 60229 – Tests on cable over sheaths
- IEC 60840 (where applicable for MV cable accessories)
- SANS 10198 – Selection, handling and installation of electric power cables
- SANS 10142-1 – Wiring of Premises (where applicable to installation)
- Manufacturer shall have ISO 9001 certified quality management.

Documentation Required

The supplier shall provide:

- Manufacturer's Type Test Certificates
- Factory Routine Test Certificates
- Factory Acceptance Test (FAT) Report
- Certificate of Conformity (CoC)
- Cable Drum Schedule
- Material Safety Data Sheet (if applicable)
- Installation Instructions
- Warranty (minimum 24 months from commissioning)

Factory Acceptance Tests (FAT)

Before shipment, each cable drum shall be tested in accordance with IEC 60502-2.

The following routine tests shall be submitted:

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- Conductor Resistance Test
- Measured according to IEC 60228.
- Partial Discharge Test
- PD level shall comply with IEC limits.
- High Voltage AC Withstand Test
- Voltage applied according to IEC 60502-2.
- No breakdown shall occur.
- Insulation Resistance Test
- Measured conductor to earth.
- Sheath Integrity Test
- Outer sheath shall be free from defects.
- Dimensional Verification

Verification of:

- Conductor diameter
- Insulation thickness
- Armour dimensions
- Outer sheath thickness

Site Acceptance Tests (SAT)

Before the cable is handed over for operation, the following tests shall be conducted by an accredited testing company.

1. Visual Inspection

- Correct cable size
- Cable identification
- Drum damage
- Sheath condition
- Cable routing
- Bending radius compliance
- Joint inspection
- Termination inspection

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2. Continuity Test

- Verify continuity of all four conductors.

3. Insulation Resistance Test

Using a 5 kV insulation resistance tester (Megger).

Measurements:

- Phase to Phase
- Phase to Earth
- Record values for all cores.

4. DC Sheath Integrity Test

- Test the outer sheath for damage after installation.

5. VLF High Voltage Test (Recommended)

- Very Low Frequency (0.1 Hz)
- Recommended for all newly installed MV XLPE cables.

Test according to:

- IEC 60502
- IEEE 400.2

Phase Identification

- Confirm correct phase sequence.

Earth Continuity Test

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- Verify amour continuity and earth bonding.

Handover Requirements

The contractor shall submit:

- FAT Reports
- SAT Reports
- Megger Test Results
- VLF Test Report
- Partial Discharge Report (if performed)
- Cable Route Drawings (As-built)
- Joint and Termination Records
- Calibration Certificates for all test instruments
- Certificate of Compliance
- Warranty Certificate

Acceptance Criteria

The cable shall only be accepted after:

- All factory tests have passed.
- All site acceptance tests comply with IEC and SANS requirements.
- No insulation failures or partial discharge defects are detected.
- Cable identification matches the approved drawings.
- Amour and sheath continuity are satisfactory.
- Test reports have been reviewed and accepted by the Employer's Representative.

This specification aligns with good engineering practice for medium-voltage cable installations at critical infrastructure such as airports, where reliability and documented compliance before energization are essential.

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