

### VOLTAGE TEST AFTER INSTALLATION

IEC 60840, Edition 4: Power cables with extruded insulation and their accessories for rated voltages above 30 kV ( $U_m = 36$  kV) up to 150 kV ( $U_m = 170$  kV) – Test methods and requirements. Recommended voltage tests after laying, jointing and terminating of cables manufactured to this standard is based on Clause 15.

#### Electrical tests after installation

Tests on new installations are carried out when the installation of the cable and its accessories have been completed. A d.c. over sheath test according to A and/or an a.c. insulation test according to B is recommended. For installations where only the over sheath test according to A is carried out, quality assurance procedures during installation of accessories may, by agreement between the purchaser and contractor, replace the insulation test.

#### A. DC voltage test of the over sheath

A direct voltage of 4 kV/mm of specified thickness of extruded over sheath shall be applied with a maximum of 10 kV between metallic sheath and outer electrode (moist backfill or a graphite layer) for a period of 1 min to demonstrate the integrity of the cable over sheath after laying (Clause 5 of IEC 60229). For the test to be effective, it is necessary that the ground make good contact with entire outer surface of the over sheath. A conductive layer on the over sheath can assist in this respect.

#### B. AC voltage test of the insulation

The a.c. test voltage to be applied shall be subject to agreement between the purchaser and the contractor. The waveform shall be substantially sinusoidal and the frequency shall be between 20 Hz and 300 Hz or 10 Hz and 300 Hz by agreement with customer. A voltage according to the table 1 below shall be applied for 1 hour.

**Table 1 Common South African Test voltages (Referenced column 1 and 10 of table 4 IEC 60840)**

1	10
Rated voltage U [kV]	Voltage test After installation [kV]
44	51
66	76
88	102
132	132

**NOTE:** For installations, which have been in use, lower voltages and/or shorter durations may be used. Values should be negotiated, taking into account the age, environment, history of breakdowns and the purpose of carrying out the test.

#### DC testing of XLPE cables

DC testing of the insulation of XLPE cables is not recommended.