

CABLE AND ACCESSORIES FOR RATED VOLTAGES OF 11 KV AND 33 KV

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PURPOSE AND SCOPE

This specification forms part of a suite of documents that define National Grid requirements for new plant. The Level 2 Specifications for cable, NGTS 2.5, covers major requirements and there is a series of Level 3 Specifications covering various specific requirements.

This document is a Level 3 Specification giving the requirements for cable and accessories at rated voltages of 11 kV and 33kV.

PART 1 – PROCEDURAL

1 GENERAL REQUIREMENTS

1.1 Cable

The cable shall meet the requirements of the relevant sections of BS 7870.

Note: Cables with a copper wire screen and no radial or longitudinal water barriers are permitted unless otherwise stated in the contract.

If the cable is to be used for a specially bonded cable system, the oversheath shall be covered with a conducting layer of graphite or other conductive material coating for electrical testing purposes.

1.2 Accessories

The accessories shall meet the requirements of BS 7888.

If the accessories are to be used for a buried cable system, the design of the accessory shall allow oversheath voltage tests on site to be carried out in accordance with SCT 36.

1.3 Cable Connections to Metalclad Equipment

If the cable system is specially bonded and the cable is connected to metalclad equipment the termination assembly shall incorporate sheath sectionalising insulation. Where there is no transformer between the termination and switchgear the sheath sectionalising insulation shall be protected against voltage sparkover during switching operations - suitable methods are the use of sheath voltage limiters (SVLs) or short-circuit links. In the later case two or more connections shall be provided not more than 500 mm in length evenly spaced around the sheath sectionalising insulation.

Note: The aim is to provide low inductance disconnectable links between the cable sheath and the metalclad switchgear enclosure to facilitate cable oversheath testing.

1.4 Cable Outdoor Termination Over Voltage Protection

Cable outdoor termination shall not be protected by arc gaps. If studies show that the cable is exposed to transient voltages, surge arresters shall protect the cable.

2 PERFORMANCE REQUIREMENTS

2.1 General Requirements

The cable shall meet the performance requirements stated in BS 7870. The accessories shall meet the performance requirements stated in BS 7888.

2.2 Conductor Thermal Cycling

The cable and accessories shall be capable of following daily conductor temperature variations between ambient and the normal design temperature.

3 TYPE TEST REQUIREMENTS

3.1 Cable and Accessories

The cable shall have passed the type tests specified in BS 7870. The accessories shall have passed the type tests specified in BS 7888.

3.2 Type Tests on Cable Oversheaths

3.2.1 Vapour Transmission Test

If the cable is to be used on a specially bonded cable system, the cable oversheath shall be tested to the following requirements.

This test is not required for oversheaths made of medium or high-density polyethylene.

Note: There is no standard test method for the measurement of water vapour transmission through cable oversheath materials. Unfortunately results are often highly dependent upon the test method used and therefore for this specification the measurement shall be based upon the desiccant method described in ASTM E96.

A quantity of desiccant is to be weighed and sealed by the test specimen in an open mouthed dish. The test cell shall be totally immersed to a depth of 120 mm in a water bath containing tap water and temperature controlled at 50°C for 14 d. The cell is to be removed from the water, dismantled and the desiccant re-weighed and the permeability of the test specimen calculated. The water vapour transmission of oversheath materials shall not exceed $2.0 \text{ g} \cdot \text{m}^{-2} \cdot \text{d}^{-1}$.