

EDF POWER NETWORKS LAB

MECHANICAL ENDURANCE TESTS OF ENERGY CABLES Shrinkage Tests

The energy cable shrinkage test benches are designed to validate the thermo-mechanical behavior over time of the different layers of the cable.

The cable is heated to its overload temperature by applying current cycles to the core. After cooling, the displacement of the individual insulating layers is measured. This process is repeated until the measured values are stabilized; It allows to quantify the maximum retraction of the main insulation and the outer protective sheath and to evaluate the compatibility of the cable with the accessories (joints, terminations)

Four shrinking benches with temperature control on core or sheath and equipped with optical sight length measuring systems allow the testing of long (about 5 m) samples of MV and HV cables, cores up to 2500 mm², with current values up to 3500 A.



Shrink tests

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Radial tests - corrosion

These tests are intended to validate the tightness of the metallic screen of the cables, under physicochemical conditions representative of the ambient environment.

The aim is to ensure the tightness of the cable after application of various stresses (mechanical, short-circuit) as well as the corrosion resistance behavior of the metal screen.

The test consists of immersing cable samples in PH 8.5 saline solution at a temperature of 80 $^{\circ}$ C for 3000 hours.

It is then possible to determine whether or not the corrosion of the screen and the penetration of water beneath the screen is possible during the examination.

This test facility consists of six corrosion tanks for testing all types of MV and HV energy cables for external diameters corresponding to cable cross-sections of up to 2500 mm².

Mechanical testing of the sheath

These tests make it possible to evaluate and verify the effectiveness of the outer protective sheath of the cables against mechanical aggressions.

The purpose of the tests is to validate the ability of the protective sheath to withstand the external stresses of impact and abrasion suffered during the laying of the cable and during its operation.

The puncture resistance is checked by a mechanical impact test is carried out using a calibrated mass falling on a cable sample.

Characteristics of the impact machine:

- Masses from 3 to 27 kg.
- Height of fall: 27 cm.



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