



Cable Testing Services

Dielectric testing for DC cables and accessories up to 640 kV

SuperGrid Institute supports cable suppliers in developing highly reliable DC products up to 640 kV. We provide a wide range of services that cover the whole product development cycle, including investigation & qualification tests.



OVERVIEW

To reach its ambitious targets, Europe needs to connect a substantial amount of renewable energy sources to the grid (450 GW of offshore wind by 2050). HVDC and MVDC cables will play a major role in the infrastructure necessary for renewable energy integration.

A wide range of topologies are envisaged for future land and subsea DC grids. Multi-terminal grids, mixed cable & overhead line systems, and hybrid AC / DC power systems will progressively replace the single point-to-point DC links that are currently being built. Consequently, the testing requirements for DC cable systems will increase so as to maintain overall system reliability.



CUTTING-EDGE TOV TESTING

We are capable of performing Transient Over Voltage (TOV) tests on cable systems up to 525 kV DC, according to the CIGRE test recommendation TB 852.

These tests enable Transmission System Operators and cable manufacturers to ensure that their HVDC extruded cable systems are reliable and capable of withstanding system-specific transient overvoltage that occur during disruptive events such as a fault in a converter station or a failure to ground the cable itself (see graph overleaf).

AVAILABLE SERVICES

Qualification tests

- Electrical type tests according to IEC 62895 & CIGRE TB 852
- Special TOV tests according to CIGRE TB 852

Investigation tests

- Test protocol definition
- AC & DC withstand & breakdown
- AC & DC ageing
- Thermal stability
- Combined hyperbaric & dielectric tests

Monitoring & characterisation

- Leakage currents, DC conductivity, space charges, partial discharges, etc.

COMPLEMENTARY SERVICES

Insulation design services

- Characterisation of solid materials (elastomers, epoxy, XLPE, thermoplastics).
- Characterisation of gases (SF₆, fluoronitrile mixes, air).
- Thermoelectrical simulations (COMSOL).
- Design assistance for SF₆ replacement in DC cable accessories.

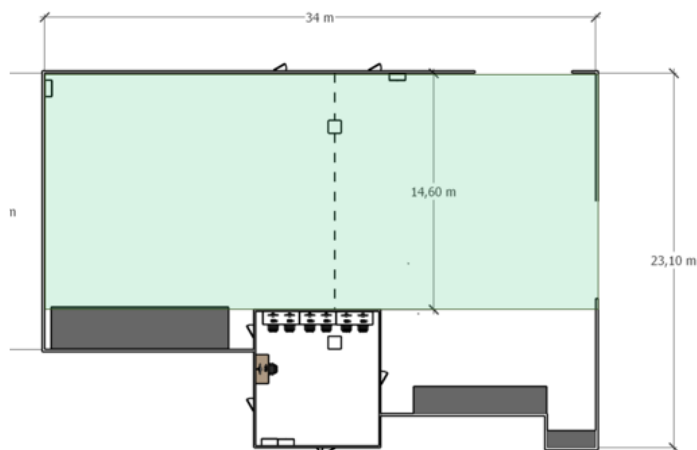
Specific transient stress specifications

- Study of the transient stress caused by faults, using electromagnetic transient simulation (EMTP) and thermoelectrical simulations (COMSOL).

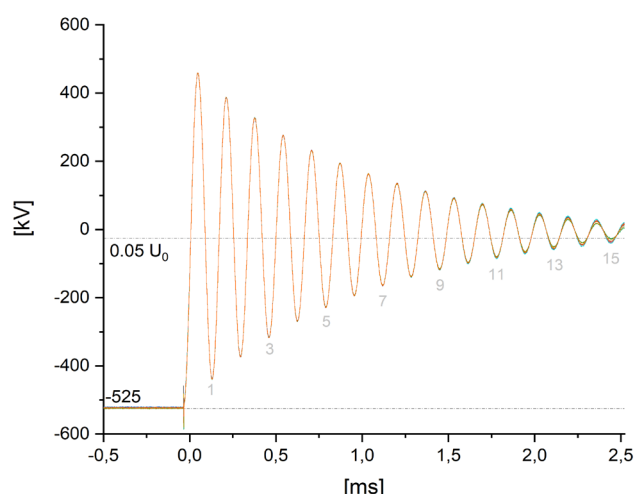
DESCRIPTION

The High Voltage test platforms consist of several test fields that can be adapted to specific tests and applications.

- A 700 m² faraday cage, with the possibility of separation into two test areas. These test fields are designed for GIS, AIS, cable systems & combined system tests.
- Two 20 m² shielded rooms for lower voltage tests (up to 400 kV).
- Crane: 2 x 5 tonnes.



Equipement	Specification	Other features
DC sources	Up to 200 kV Up to 400 kV	<ul style="list-style-type: none"> • Easy use and handling • Direct cable connection up to 200 kV • Polarity reversal
HVDC sources	Up to 800 kV, 30 mA Up to 1200 kV, 20 mA	<ul style="list-style-type: none"> • Polarity reversal • Slope adjustment from 1 to 20 kV/s
HVAC source	Up to 660 kV	<ul style="list-style-type: none"> • Slope adjustment from 1 to 16 kV/s • Fast switch-off unit available
HVAC & HVDC metal clad source	Up to 750 kV AC Up to 850 kV DC	<ul style="list-style-type: none"> • Well-suited for long-term / ageing tests • Access to outdoor test field (L 11 m x W 11 m x H 15 m)
Impulse generator	Up to 2000 kV 200 kJ	<ul style="list-style-type: none"> • Possibility of adjusting the generator to deliver impulses from 20 kV to 2000 kV • BIAS and Super Imposed compliant
High current heating system	4 x 5 kA	<ul style="list-style-type: none"> • Automatic compensation unit for the optimisation of the input power rating



Damped oscillations TOV testing at 525 kV / 6000 Hz.

CONTACT

For additional information or to ask for a quote, please contact :

sales@supergrid-institute.com

MEASUREMENTS & MONITORING



Voltage measurements are performed with factory calibrated dividers. All of our HVDC generators have embedded RC dividers.

Two additional PD-free dividers can be positioned to accommodate different test set-ups:

- Universal RC divider, up to 2000 kV LI, 1800 kV SI, 1000 kV DC, 700 kV DC.
- Capacitive divider up to 800 kV AC, with embedded PD measuring impedance.
- GIS RC divider up to 850 kV DC.

Low electromagnetic noise levels suitable for PD measurements (<0.5 pC @ 600 kV DC) and leakage current measurements.

Other specific measurements can be carried out using the instruments available in the laboratory (UHF systems, UV systems, ultrasounds, electrometers, high speed camera, etc.).