

High Voltage, Highest Standards

- High Voltage Tests
- Temperature Rise Tests
- Environmental Tests
- Testing of Cables
- Tests at Multiple Stresses



Test engineers with extensive practical and theoretical knowledge in high voltage testing.





Your Partner in High Voltage Testing Excellence

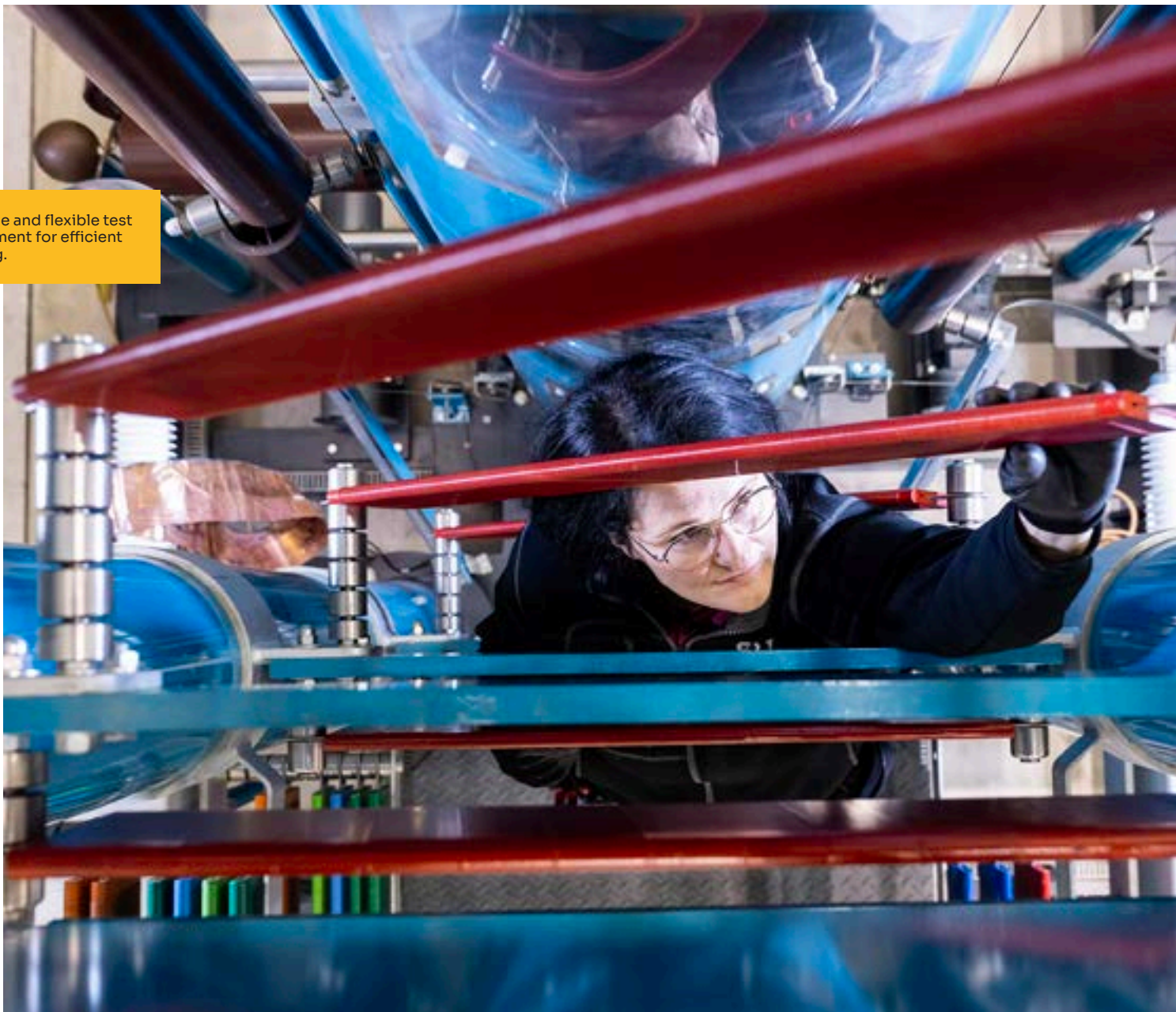
STRI is a leading independent test laboratory based in Ludvika, Sweden. We serve manufacturers of electrical equipment worldwide.

Accredited according to ISO/IEC 17025, we provide quality testing and trusted results. We are a member of SATS and the Short Circuit Testing Liaison (STL).

Why Clients Choose STRI

- World-class laboratory for high voltage equipment testing
- Unique environmental and pollution test facilities
- Large-scale indoor and outdoor test capabilities
- Flexible set-ups for full-scale product testing
- Trusted by major global manufacturers and operators

Reliable and flexible test equipment for efficient testing.



STRI Accreditation

STRI high voltage laboratory is accredited by SWEDAC, the Swedish accreditation body, giving our clients the benefit of knowing that we provide independent quality testing and competence.

STRI is a member of SATS, the Scandinavian Association for Testing of Electric Power Equipment which is a member of the Short Circuit Testing Liaison (STL).





Test Facilities Designed for Your Needs

Indoor Test Halls

- 5 large high voltage halls (from 10×13×12 m to 25×37×30 m)
- Fully shielded for low interference
- System voltage testing up to 800 kV

Pollution & Climate Test Hall

- Diameter 18 m, height 23 m
- Temperature range -10 °C to +55 °C
- AC voltage up to 900 kV, DC up to ±1 200 kV

Medium Voltage Test Cells

- Two test cells (10×10×5 m)
- Impulse generator (400 kV) and AC transformer (100 kV)

Cable Testing Facilities

- Indoor underground facility for pre-qualification testing
- Outdoor test area for full-scale tests

Specialized Chambers

- Long-term ageing
- Tracking and erosion
- Ion migration
- High and low temperature testing

Independent High Voltage Type Testing

We perform accredited high voltage type testing up to 800 kV system voltage in accordance with international standards.

Testing is available for:

- Insulators
- Cables and accessories
- Bushings
- Circuit breakers
- GIS equipment
- Surge arresters
- Disconnectors
- Instrument transformers
- Capacitors
- HVDC valves

Cable Testing

STRI offers advanced facilities for electrical testing of AC and DC transmission cable systems, including:

- Testing of AC cables to IEC, IEEE, ICEA standards
- Long-term heating cycle voltage tests (AC/DC)
- HVDC type tests per Cigré TB 852, Electra 72/189
- Pre-qualification testing in controlled environments

Pre-qualification Testing

STRI has two indoor facilities for pre-qualification testing in accordance with Cigré TB 852, IEC 60840, and IEC 62067. Tests can be conducted in a test hall, or underground facility – both with controlled environments – or outdoors.

Various media such as water or soil can be introduced into the test circuit, along with configurations like snaking and ducts. Maximum test voltages are 600 kV AC and 1 050 kV DC, with heating available via AC or DC current.



Underground testing facility for pre-qualification testing.



Several test halls for testing at different voltage levels.

Type testing on HVAC or HVDC cables.





Dielectric and Long-Term Stress Testing

Dielectric Type Test of GIS Equipment

STRI has the capability to perform dielectric type tests on Gas Insulated Switchgear (GIS), including components such as breakers, disconnectors, and busbars, for system voltages up to 1100 kV.

Testing includes Test Duties 1, 2, and 3 according to IEC 62271-102, covering the making and breaking of bus-charging currents on disconnectors. Test Duty 2 can be carried out with currents up to 2 A.

For efficient handling, test bays can be mounted on a flexible frame that allows even large set-ups to be moved while fully assembled.

Three-phase testing of GIS is available up to 420 kV system voltage.

Multiple Stress Test

STRI has two test chambers for 5 000-hour AC and DC multiple stress testing in accordance with IEC TR 62730. Environmental conditions such as sunlight, rain, humidity, heat, fog, and salt fog can be precisely controlled.

Both chambers are equipped for continuous monitoring of voltage, environmental parameters, and leakage current from individual test objects. They can also operate at different voltage levels simultaneously, offering high flexibility in testing set-ups.

A larger chamber is available for the 2 000-hour accelerated electrical environmental test on insulators, performed according to the TERNA specification.

Simulating Harsh Environments



Pollution & Environmental Testing

STRI's climate test hall is among the most advanced in the world, enabling pollution testing of HVAC and HVDC equipment up to 800 kV. It supports test voltages up to 900 kV AC and ± 1200 kV DC, with low PD levels thanks to minimized external interference. Temperature and humidity can be controlled between -10°C and $+55^{\circ}\text{C}$. The hall allows application of pollution, rain, fog, hoarfrost, snow, and various ice types.



Snow & Ice Testing

In the climate test hall snow and ice tests of insulators, apparatus, and conductors can be performed. Different types of snow and ice with client defined properties can be created.

It is also possible to combine pollution and ice tests. Insulators are first contaminated and then accreted by ice produced from water with certain conductivity. Tests can be performed on full scale AC and DC equipment. STRI also performs standard mechanical ice tests for disconnectors.

Climate test hall for salt fog or clean fog testing at high voltage levels.



Technical Capabilities at a Glance

Test Ratings

- Lightning Impulse: 2 800 kV
- Switching Impulse: 1 850 kV
- AC Testing: 1 200 kV
- DC Testing: 1 600 kV
- Partial Discharge & RIV: 1 200 kV
- Capacitance & Tan δ : 1 000 kV
- Temperature Rise Testing:
8 000 A AC / 8 400 A DC

Test Hall Sizes

- 25×37×30 m
- 18×36×21 m
- 18×18×20 m
- 10×13×12 m
- Pollution Test Hall:
Ø18×23 m
- Medium Voltage Cells:
10×10×5 m

Facilities have electromagnetic shielding for low background levels during PD and RIV measurements.

SF₆ gas and transformer oil handling equipment is available.

Specialized Electrical Testing



Tracking & Erosion Testing

STRI offers chambers for 1000-hour salt fog and 5 000-hour test at multiple stresses. A large 3×3×5 m chamber handles voltages up to ~160 kV, while a smaller chamber is used for lower voltage levels. Tests are typically performed according to IEC 62217 and IEC 62730 (insulators) and IEC 60099-4 (weather ageing on surge arresters).



Water Drop Corona Testing

STRI offers high voltage testing to verify the correct dimensioning of corona and grading rings on composite insulators. Based on electric field (E-field) calculations, the test ensures reliable long-term performance under high voltage stress.



Medium Voltage Testing

STRI has two medium voltage test cells (10×10×5 m), equipped with a 400 kV impulse generator and a 100 kV AC transformer. These cells are used for type testing of cables, accessories and other products in accordance with IEC 60502 and other relevant standards.



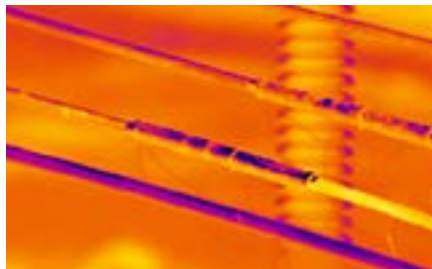
Highly skilled test engineers ensure safe and reliable testing.

Ensure Durability Under Electrical Load



Ion Migration Testing

STRI's ion migration test facility enables clients to verify that insulators can cope with 50 years in operation and through varying temperatures. The test facility consists of an oven that can be heated to between 90 °C and 150 °C and has room to test 50 insulators simultaneously in accordance with IEC 61325 clause 18.



Temperature Rise Testing

Temperature rise tests can be performed with currents up to 8 000 A AC and 8 400 A DC. The temperatures are registered with loggers handling a great number of channels.

Temperature rise tests can be performed at elevated surrounding temperatures up to 60 °C.

STRI also has test tanks for testing of oil/air bushings.



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