



Von Roll Corporate University Insulation Training 2011

vonRoll



Overview

Continuous on-the-job training is imperative for sustainable success in a competitive environment. That's why in the early 90s, Von Roll began organizing training on insulation technology related to rotating electric machines. Over the years, this has grown into a unique program of insulation training within the Von Roll Corporate University. The objectives of this program are:

- » Better understanding of insulation technology for electric rotating machines and up-to-date knowledge on insulating materials and systems
- » Practical experience in the application of electrical insulating materials

Von Roll offers various courses on electrical insulation technologies for electric machines both to our customers and to our own technical staff. The course content focuses on the insulation of electric rotating machines. Due to a growing interest in training on low-voltage insulation technologies, our course offering now covers both high-voltage and low-voltage applications.

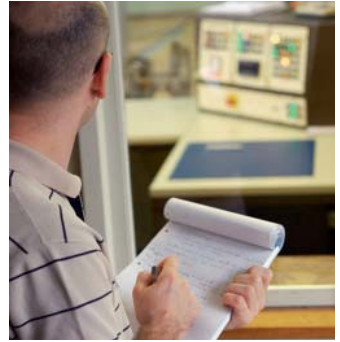
Course offerings

The insulation courses we offer include:

1. Standard course
2. Advanced course
3. Low- and medium-voltage courses

Due to international participation, the courses are generally held in English. Special courses can be held with translation.

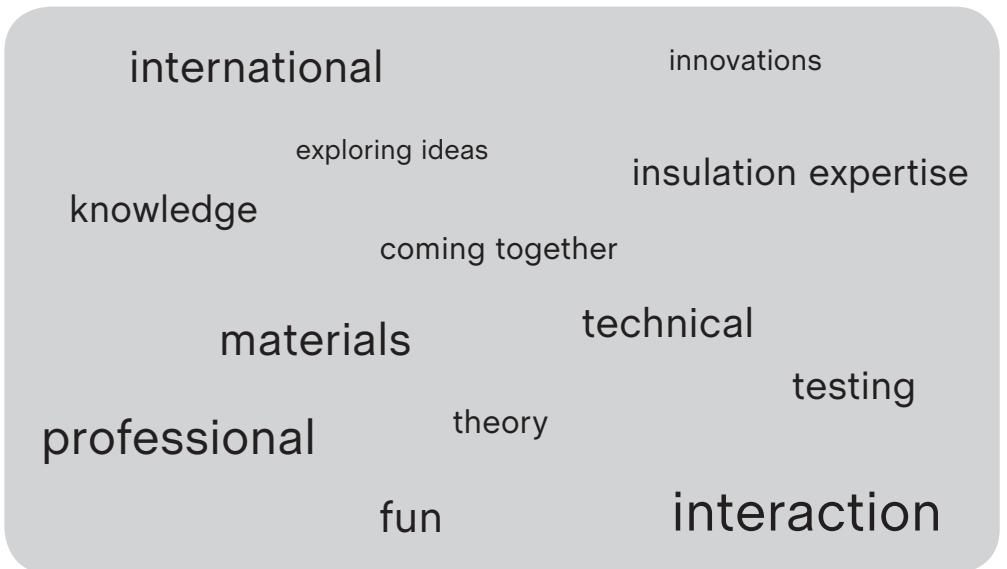


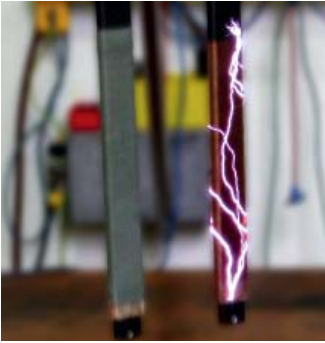


Learning approach

Our courses are designed as an interactive educational experience with formal classroom lectures as well as practical hands-on laboratory work and plant tours. Product and application knowledge is shared with the trainees by our instructors, who have a wide variety of background experience. The instructors include Von Roll application engineers, R&D personnel, and marketing specialists, who have years of field experience or education, including several PhDs in electrical and chemical engineering.

We find that these insulation courses are a two-way process—we also learn from you. Discussion with course participants has led Von Roll to integrate their experiences and challenges into new generations of products and services. It's all part of the continuous process of innovation. So bring your questions with you and discuss them with both our experts and your peers in the industry interactively. We look forward to working with and educating you on a wide variety of topics.





Standard high-voltage course

The standard insulation course has developed over the years now focuses almost exclusively on insulation for high-voltage electric rotating machines. It has become increasingly popular and is now open to everyone involved in insulation technology for rotating electric machines and wanting to remain up to date. The target audience for this course consists of technicians, engineers, and managers who wish to gain deeper insight into insulation technology and electrical insulating materials. Participants should have a basic knowledge of electrical engineering, physics, and chemistry.

The course is held in our head office in Au/Waedenswil near Zurich, Switzerland, with a day-long excursion to production facilities. The number of participants is limited to twelve in order to ensure the quality of interaction.

Course content

The standard high-voltage course includes the following topics:

1. General knowledge

- » Basics of motors and generators
- » Mica and mica paper
- » Insulation materials and their evaluation

2. Insulation technology

- » Resins and varnishes, impregnation techniques, ecological and toxicological issues
- » Resin-rich technology, theory and practice
- » VPI technology, theory and practice
- » Suppression of partial discharge
- » Winding wires
- » Composite materials
- » Support materials
- » Cost structure of rotating machines
- » Processing equipment and technology

- » Failure mechanisms
- » Testing of sample coils
- » New developments

3. Insulation systems

- » High-voltage motors
- » Large power generators
- » Traction motors
- » Wind-turbine generators

4. Factory visits & application exercises

- » Flexible materials and liquids
- » Winding wires
- » Composite materials
- » Applications laboratory
- » High-voltage laboratory



Advanced high-voltage course

We find that, although all of the course participants benefit from the training, there is a wide spectrum of backgrounds and some participants already have extensive knowledge of insulation technology. That's why we offer a four-day advanced course in our facility in Breitenbach, Switzerland with a one-day excursion to our facilities in Delle, France. In this course we assume that the participants are well grounded in most of the topics covered by the standard training, and focus even more on discussion and practical work. Here you will spend more time in the laboratories and production facilities than in the classroom, so bring comfortable shoes!

The number of participants is limited to eight due to the interactive nature of the program. We ask you to inform us in advance about your questions and topics of interest, so that we can better prepare and make sure the appropriate experts will be available to you.

Course content

The key to a successful advanced HV course is interaction and discussion between the participants and our experts. The course structure is adaptable and may include the following:

1. Insulation technology

- » Fundamentals of insulation technology
- » Chemistry for electrical engineers
- » Failure mechanisms of HV insulation
- » Special materials and new developments
- » Suppression and measurement of partial discharge
- » Processing equipment and technology
- » Overview of testing for rotating machines
- » Roundtable discussions
- » Composite materials

2. Practical work

- » Fundamentals of insulation technology
- » Wire types, quality, and testing
- » Construction and application of mica tapes
- » Quality-control labs, mica and liquids
- » Factory tours
- » Testing (high-voltage laboratory)



Low- and medium-voltage course

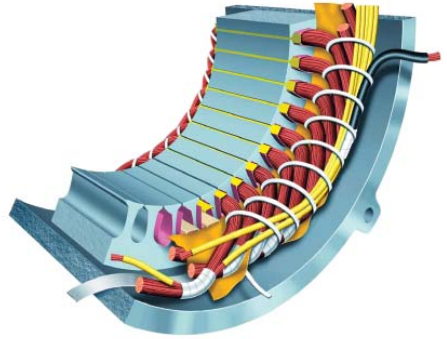
We offer training on the selection, testing, and application of insulation materials for low- and medium-voltage applications, including such market segments as consumer products, industrial and commercial motors and generators, automotive electrical components, wind-turbine generators, portable power, and transformers.

This course comprises three days of classroom and hands-on learning that targets the needs of production and design engineers who require a more thorough knowledge of insulation systems. It is also useful for technical purchasers and marketing and field-support staff who address performance and warranty questions.

Course content

The course takes place at our facilities in Schenectady, New York. The curriculum has been adjusted to cover the following topics:

- » Introduction and fundamentals
- » Magnet wire
- » Flexible insulation
- » Banding tape
- » Ancillary materials
- » Varnishes and resins
- » Resin application and potting compounds
- » Transformer insulation systems
- » Mica and mica tapes
- » VPI processes
- » Insulation systems for traction motors
- » VPI and RR processing
- » Insulation-system compatibility epoxy
- » Insulation-system compatibility polyester
- » UL and tank-analysis labs
- » Electrical testing



Low-voltage course

This training provides a detailed view of insulating materials and systems for low-voltage rotating machines, including their selection, processing, and testing.

The course is three days of classroom learning and hands-on activities well suited for production and design engineers, R&D staff, repair specialists, end-users, and other technical staff who require a more thorough knowledge of these insulation systems.

Course content

This course takes place at our center of excellence for liquids in Meyzieu, in the region of Lyon, France, and includes the following topics:

- » Introduction and fundamentals
- » Failure analysis
- » Winding wire
- » Flexible insulation
- » Electrical adhesive materials
- » Banding tape
- » Impregnation resins and varnishes
- » Potting and encapsulating compounds
- » Component and systems testing (UL focus)
- » Customer acceptance testing
- » Stresses in inverter-driven drives



Course dates in 2011

The courses in 2011 are scheduled to take place on the following dates. Courses on selected topics can be organized on request by special arrangement.

Standard high-voltage course

- » March 14–18
- » June 27 to July 1
- » September 12–16
- » November 14–18

Low-voltage course

- » May 18–20

Advanced high-voltage course

- » October 11–14

Low- and medium-voltage course

- » October 25–27

Further courses may be organized depending on demand

Fees

The course fees are payable in advance and include many amenities; course-specific information is provided to applicants and is available upon request.

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|----------------------|-----------|-----------------------|-----------|
| » Standard HV course | CHF 3 500 | » LV course, Americas | USD 2 800 |
| » Advanced HV course | CHF 2 500 | » LV course, Europe | EUR 1 900 |

Conditions

The maximum number of participants in each course is limited. Typically, applicants are registered on a first-come-first-serve basis. In the case of there being more applicants than available places, the course organizers may decide together with the Von Roll host contact on the attendance priorities. If desired, applicants on the waiting list are transferred to the next available equivalent course. Late cancellations are subject to our cancellation policy.

As one of Switzerland's longest established industrial companies, Von Roll focuses on products and systems for power generation, transmission and distribution. Von Roll is the sole full-range supplier of materials and systems for the insulation of electrical machines as well as high-performance products for various high-tech industries.



Mica

All materials related to high-voltage insulation. Von Roll's commitment to mica starts with mining and ends with finished tapes.



Flexibles

Insulating flexible materials for low-voltage applications such as flexible laminates and adhesive tapes.



Wires

Insulated round, flat and litz wires for high-voltage, low-voltage and electronic applications.



Transformers

High-performance transformers for power transmission and distribution, tailored solutions to all applications of today's energy supply companies.



Cables

Mica tapes for fire-resistant cables. Von Roll provides a wide range of products that are ideally suited to all commonly used standards.



Testing

Von Roll provides electrical, thermal and mechanical testing of individual materials as well as complete insulating systems. We are UL-certified.



Liquids

Impregnation resins for high and low voltage, potting resins, casting resins, as well as encapsulating and conformal coatings.



Ballistic Protection

High-quality systems for armored defense based on thermoset / thermoplastic products in single-use or tailored combinations.



Composites

Engineered materials made from a resin and a support structure with distinct physical, thermal and electrical properties. They can be molded, machined or semi-finished.



Training

Von Roll Corporate University provides a training program in high- and low-voltage insulation to its customers.

Contact

You may wish to contact Von Roll customer service or your regional Von Roll sales manager for further details and information. The course organizers may be directly contacted at: vonroll.university@vonroll.com

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