



PERFORMANCE MATERIALS

High Voltage Insulation System Evaluations

Accelerate innovation with testing and certification services from UL

Safety and performance of high-voltage (HV) electrical insulation systems (EIS) are paramount. As the transformer and rotating machinery industries continue to innovate and new suppliers and new insulating materials enter the marketplace, UL can help provide services to close the knowledge gap, test new materials, and verify compliance.

UL's HV EIS certification lets specifiers and end-users know that the insulation system has been tested and certified to meet the requirements of globally accepted test methods. To offer this solution in a more streamlined fashion, UL has collaborated with ELTEK International Laboratories for their technical expertise and testing services. By working together, we have developed a simplified approach for timely and efficient handling of HV projects.

New Simplified Approach:

A new, simplified approach has you working with UL to manage the entire process starting with program assessment and all the way to certification.

Phase I: Program Assessment

In the program assessment phase, UL will review your specific needs to clearly understand your priorities. Our experts will collaborate with you and ELTEK Labs to identify applicable technical requirements and develop a test procedure & protocol plan that best matches your needs and success criteria. This phase also often includes pre-testing services to help identify potential design risks and ensure, to the best extent possible, a successful certification project.

Phase II: Testing and Certification

UL will work with you closely in the testing and certification phase as we perform a thorough construction review and coordinate with ELTEK Labs to perform the full thermal aging evaluation, while keeping you informed and making adjustments as needed along the way. After completion of the testing, UL will review the data to determine compliance with the applicable test method requirements. Insulation Systems that meet both UL's requirements and those of the test method are granted authorization to bear the UL Certification Mark and are published on one or more of UL's industry leading certification databases ([Online Certification Database](#) or [iQ™ for Systems](#)).

Phase I

Program Assessment

- Assess - Review needs and priorities
- Pre-Testing - Test early designs to mitigate risks and develop an appropriate test plan
- Plan - Develop test procedure and protocol

Phase II

Testing and Certification

- Construction Review - A thorough review of the materials and material thicknesses used
- Full Thermal Aging - Accelerated heat aging and testing for dielectric breakdown
- Certification Review - Assessment of compliance with established test method requirements

To get started, contact UL Sales today at PMSales@ul.com / UL.com/EIS.

Test Methods:

UL utilizes the following industry-accepted test methods to determine the appropriate thermal class rating of electrical insulating systems. During the program assessment, our experts will help you identify and navigate the appropriate test methods for you.

Rotating Machinery:

- IEC 60034-18-31 or others in the 60034-18-series
- IEEE 1776

Transformers:

- Future IEC 61857 Part 41, Approved New Work Item
- IEEE C57.12.60

Frequently Asked Questions:

What types of manufacturers and insulation systems are covered by this test program?

This test program is intended for insulation material suppliers and end-product manufacturers (motors, generators, and transformers) who are interested in evaluating insulation systems rated over 1,000 Volts.

Why did UL choose to collaborate with ELTEK Labs?

ELTEK Labs is the world leader in the field of testing for EIS. This new level of collaboration is designed to bring the global leader in HV insulation systems testing and the global leader for insulation systems certification together, in an effort to focus on the client's needs for reliability, innovation and speed to market.

What is the submittal process?

UL and ELTEK Labs have developed a simplified approach for timely and efficient handling of all HV projects. The simplified approach allows UL to handle the entire process to deliver the desired certification, from conception to testing to certification.

How much does it cost and how long does it take to have an HV insulation system tested?

Cost varies depending on the scope of the certification. Once UL and ELTEK have collaborated with you to determine the full scope of the investigation, UL will work with you in determining

the estimated cost and time frame for Phase I: Program Assessment. As part of the completion letter for the Program Assessment, an estimated cost and time frame for Phase II: Testing and Certification will be provided. For rough budgetary estimates, please contact UL directly.

Where will my project be handled and tested?

UL has knowledgeable experts globally to assist clients with HV EIS certification. Testing of products will be performed at ELTEK Labs in St. Charles, MO, USA under UL's Data Acceptance Program requirements, which provides a means for UL to use the test data for UL Mark Certification.

How are the test method and test temperatures determined?

UL's team will review your specific request and help develop a plan that best matches your needs and success criteria. This includes identifying the applicable test method(s) and/or pre-testing services to help identify the appropriate test temperatures.

Can I test multiple insulation systems?

Multiple designs or iterations can be evaluated under the same request. These include potentially modified insulation systems to allow for alternate insulation materials or thicknesses to be used. This approach allows for a reduction in both overall cost and total testing time.

What is documented in the Certification Report?

All critical insulating materials and non-insulating materials are documented in the UL Certification Report, including winding wires, varnishes, encapsulates, tie cords, spacers and any other materials that contact the winding wire.

Can UL issue an IEC certification and Certificate of Compliance Document that my insulation systems were evaluated to the IEC requirements?

Insulations systems that comply with the IEC 60335-1 Annex C requirements can be covered under UL's ODCA2 Insulation System category as a complimentary certification which includes a Certificate of Compliance letter.

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