

SynFlex SynLab®

Laboratory Services &
Services acc. to UL 1446



 **SYNFLEX**
Insulation Systems

SynFlex

What we do

The core competence of SynFlex lies in the development, manufacturing and distribution of conducting and insulating products for the electrical insulation systems of electrical motors, transformers and generators. Thanks to process and product innovations, SynFlex is a recognized quality leader, setting standards in the electrical industry.

As the first laboratory in Europe for short and long-term tests, SynFlex provides efficient and effective testing and certification of electrical insulation systems according to the Third Party Test Data Program by UL. The objective is to supply the customer a perfect total package of products and services.





SynFlex & UL

A strong partnership

The basic idea of UL is to make the world in which we live and work into a safer place. This pertains specifically to the field of electrical safety. The chemical interactions of various products within an electrical insulation system (EIS) is the focus here.

In general, the products are divided into electrical insulating materials (EIM) and non-electrical insulating materials (NIM).

In addition to this distinction, there are two categories of electrical insulation systems: The OBJY2 as the initial variant encompasses a UL-rated EIS for an electrical motor, e.g. The second variant OBJS2 pertains to the manufacturer of materials such as impregnants that can be used in a system.

For several years now, SynFlex has been working successfully with UL in the field of electrical insulation systems. As the first test laboratory in Europe acc. to the UL Third Party Test Data Program (TPTDP), the SynLab® carries out all the tests required for the enhancement and new configuration of an EIS.

These include endurance tests (FTA, DLTA), system enhancements (CCT), adaptation of existing systems, as well as material-specific individual tests that are carried out according to UL standard 1446.

SynFlex possesses the important UL system know-how without which a successful test completion is hardly possible. The induction of SynFlex as a voting member in the standards technical panel (STP) for the UL Standard 1446 underscores the close cooperation between the SynFlex Group and UL.

The objective of this cooperation is to support customers in new approval, enhancement or adaptation of existing UL systems. A local contact, paired with specific product know-how, tremendously facilitates handling. The more than 100 successfully conducted tests and projects are a testimony to the quality of our range of services.



SynLab® according to UL 1446

- Full Thermal Aging – FTA
- Chemical Compatibility Test – CCT
- Short Term Thermal Aging for Motors – STTA

SynFlex insulation systems:

- Class B (130°C)
- Class F (155°C)
- Class H (180°C)

The SynLab® as a test lab offers its customers a wide spectrum of services in cooperation with the TPTDP by UL. These range from endurance tests, system enhancements, through the adaptation of electrical insulation systems, right down to compatibility tests.



SynFlex – system consultant & customer partner

Your overhead, your money, your time

Your advantages

Consider the opportunity costs: With SynFlex, you have significant time savings and reduction in overheads. As a result, you save costs and, at the same time, receive in-depth advisory with respect to UL, combined with the necessary know-how on the materials you are using.



One point of contact as a link to UL and thus avoidance of language barriers as well as accelerated communication and handling.



Many years of experience with UL and contacts to UL.



Saving of resources and costs.



Specific product know-how and system expertise as support for project implementation.



25,000 standard items and access to a vast inventory of samples.

Cooperation SynFlex & UL

Test acc. to UL 1446

SynFlex, the system consultant and partner

- UL system know-how
- System consultation
- Cooperation with UL
- Voting Member of Standards Committee (STP) of UL1446
- Member of IEC 61857-42

SynLab for tests acc. to UL 1446

- CCT test (Chemical Compatibility Test)
- FTA test (Full Thermal Aging Test)
- STTA (Short Term Thermal Aging for Motors)
- Magnet wire (Long Thermal Aging Test)



Safety. Science. Transformation.™

UL LLC ISSUES THIS

Certificate of Participation

SYNFLEX ELEKTRO GMBH

AUF DEN KREUZEN 24, BLOMBERG 32825, GERMANY

The laboratory above has been assessed and found to comply with the applicable requirements of ISO/IEC 17025 In accordance with UL's Data Acceptance Program (DAP) and has been qualified as a DAP participant. The laboratory is hereby authorized to submit testing data to UL for product certification purposes as allowed by the schemes and for the product types and standards identified in the DAP Scope.

Third Party Test Data Program (TPTDP)

DA File: DA1100

Issued: 11/14/2023

Expires: 6/20/2024

Paul Mouawad
Program Owner

SynLab® test laboratory

Comprehensive testing services for Asia and Europe

The SynFlex Group test laboratories at the SynFlex locations in Blomberg and Shanghai, and at headquarters of SHWire in Lügde are known for their variety of thermal, mechanical, chemical and electrical testing procedures.

In the SynLab®, tests are conducted not only on the interactions of various components of the electrical insulation system as part of UL standard 1446, but also on selective and long-term impacts of products and product groups.

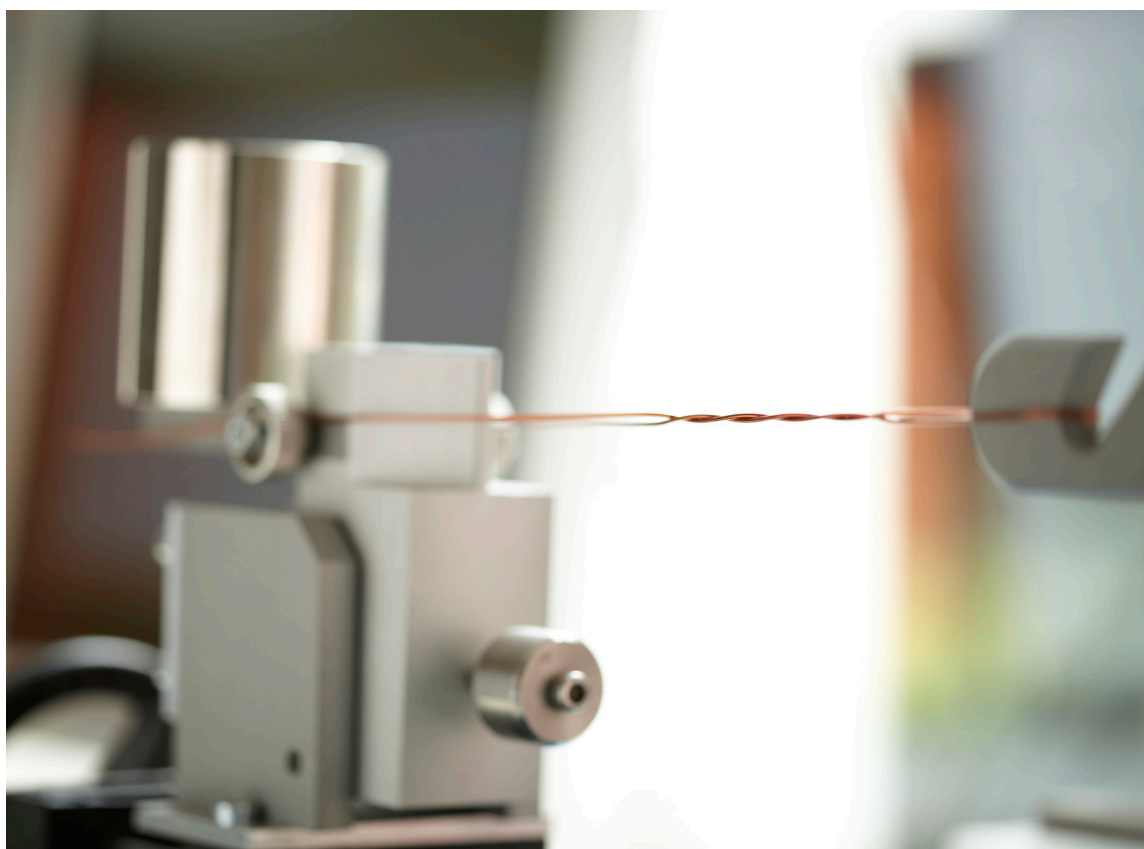
In addition to a variety of tests accompanying production and monitoring quality, the SynLab® also stands for intensive tests in the field of R&D, as well as customer-specific evaluations. With detailed analyses, we help our customers analyze the materials deployed, along with their quality and structure.

Trained personnel continuously monitors not only the entire flow of incoming goods, the production processes taking place in our company, as well as outgoing goods, they are also available to you Group-wide for questions and advisory services.

SynLab® performs all tests with state-of-the-art equipment for the winding industry, if requested also in accordance with IEC standards (also IEC 61857-42).

Tests SynLab®:

- thermal
- chemical
- mechanical
- electrical
- optical
- long-term tests
- customer specific tests (stator-testing)



SynLab® as a test laboratory

- fatigue analyses
- endurance measurements
- material analyses
- damage analyses
- tests according to DIN EN 60851
- chemical analyses
- fundamental analyses
- surface analyses
- contamination analyses

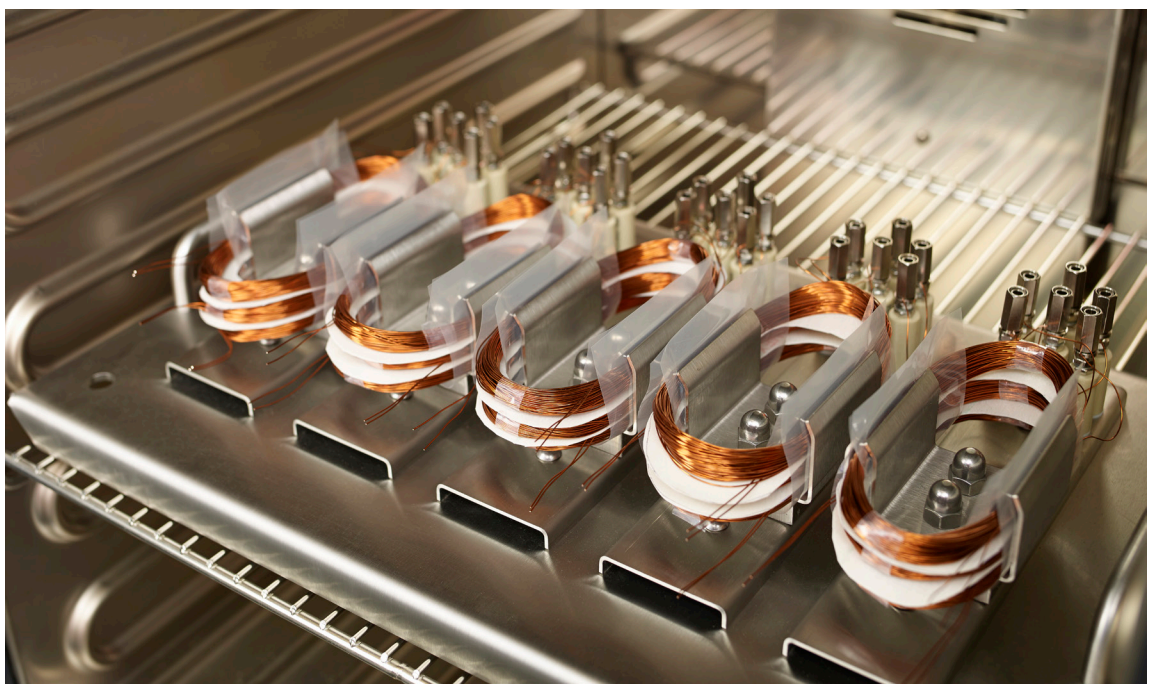


FTA Test / Thermal Aging GPM Model

Full-Term Thermal Aging for Electrical Insulation Systems

FTA tests by means of GPM-Model (General Purpose Model) are mainly performed for:

- Development of new systems
- Expanding existing systems with EIM
- Reduce thickness of EIM



STTA-Testprogram

Short-Term Thermal Aging for Motors

IEC 60335-1, Appendix C describes the test method:

The STTA Test Program allows accelerated certification of electric motors in low-voltage applications (≤ 1000 Volt). The test program and certification of electrical insulation system meets the requirements of UL/IEC 60335-1, Appendix C for specified temperature classes (B, F, H etc.) for use in accordance with UL Standard 1004-X series (electrical rotating machines).

Brief description:

- E.g. desired thermal class B (130°C) (short-term test at temperatures up to 40 °C above thermal rating (e.g. 170 °C)
- 8 systems (test construction with 6 systems), 2 systems used for screening (pre-test)
- Compact design (NEMA 56 frame or smaller)
- Motors with high resistance

Test time	Temperature increase for temperature class
1000 h	40 °C
2000 h	30 °C
4000 h	20 °C
8000 h	10 °C



CCT Test or Sealed Tube Test

Chemical Compatibility Test for Electrical Insulation Systems

Sealed Tube Tests (CCT-Test) are usually performed under the following conditions:

- Alternative to expensive and time consuming full thermal aging tests (FTA), if possible
- Add Minor Components such as lead wires, adhesive tapes, winding tapes, layer insulations, potting compounds etc.
- Add varnishes/ resins also as Major Component
- Add multi-layer insulation materials also as Major Component in consideration of the minimum thickness from the EIM material such as (PET-film or Aramid paper) of the original reference system
- Enamelled copper wires can be added/interchanged in accordance with Appendix A of UL 1446

Performance and Evaluation

- Performance in accordance to ASTM D5642
- Tubes conditioned for 14 days, 25 °C above system temperature
- Evaluation of thermo-chemical degradation of wire insulation
- High-voltage test results on enamelled wires (Twisted Pairs) for the candidate tube must reach 50 % of the reference tube



Contact

Get in touch with us

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In addition to the company-specific product ranges of SHWire, SynFlex and Iso-Tek, the SynFlex Group offers all customers interdisciplinary services to which they have access at all times.

You can take advantage of these Group-wide services internationally at any time in all the SynFlex locations in Europe, Asia, Turkey and beyond.

SynFlex Group and UL – A strong partnership

As the first test laboratory in Europe to participate in the UL Third Party Test Data Program, the SynLab® carries out all the tests required for the enhancement and new configuration of an EIS.

The objective of this cooperation is to support customers in new approval, enhancement or adaptation of existing UL systems.

The SynLab® test laboratory – Comprehensive testing services

The SynFlex Group test laboratories at the SynFlex locations in Blomberg and Shanghai, and at headquarters of SHWire in Lügde are known for their variety of thermal, mechanical, chemical and electrical testing procedures.

The SynLab® is regularly inspected by UL, thus confirming its competence. The qualification is achieved by UL audits performed in our laboratory according to international and national standards, in particular the standard UL 1446 “Systems of Insulating Materials General”. Due to its memberships in expert committees SynFlex is involved in change and validation processes of norms and standards. Customers thus benefit from optimal project processing and a state-of-the-art laboratory that can carry out short or long-term tests according to UL 1446 and IEC standards or customer-specific tests for systems or materials.

SynServ – services of the SynFlex Group Logistics competence

Rapid and reliable availability of goods is the core objective of logistics in the SynFlex Group. From Blomberg, we supply our logistics and production plants of our subsidiaries and affiliates worldwide. Moreover, the complete logistics of SHWire are handled via the logistics center at the Blomberg plant.

Metal trading

Fluctuating volumes of demand, volatile commodity exchange prices and the necessity of a reliable basis for calculation are realities that are extremely difficult to reconcile when dealing with metals. To provide you, as a customer and partner of SynFlex Group, with greater certainty, not only commercially but also organizationally, we offer you several services, for example copper hedging, alongside the material supply of copper and aluminum.

Product management

The product management of the SynFlex Group provides you with competent support in the development, optimization and implementation of new ideas. We calculate, test and certify materials, components, structures, products or production processes. The technical and economic know-how of our product managers bridges the gap between research and market-driven products.



SynFlex International

The network of the SynFlex Group provides its customers with consistent quality of service and products, goods availability and professional advice. We have production and logistics capacities at every location in Europe, Asia and Turkey. Thanks to our extensive sales network, we are also active in countries where we do not have a site, and we can provide individual advice there.

SynFlex Scandinavia

With our location in Copenhagen, we deliver to all of Scandinavia and parts of the Baltic countries.

SynFlex France

With our location in Paris, we supply France, the southern countries of Spain and Portugal, as well as North Africa.

SynFlex Italy

With our location in Bologna, we deliver to customers in Italy and to neighboring countries in the Eastern Mediterranean region.

SynFlex Austria

Our location in Vienna covers not only the Austrian market but also the entire Southern and Eastern European region from the Czech Republic and Bulgaria to the Ukraine.

SynFlex Poland

With our location in Warsaw, we deliver to customers in Poland, the southern Baltic countries, all the way to Belarus.

SynFlex Turkey

With our location in Istanbul, we supply customers in Turkey. At the same time, this location serves as a gateway to the Caucasus and the Middle East.

SynFlex China

With our location in Shanghai, we serve the vast Chinese market, along with all neighboring countries in Central, Southern and Eastern Asia.

At highest level.
The complete **SynFlex** product range.

Winding

Premium Winding Wires

SHWire

Winding Wires

SynWire

Litz & Special Wires

SynWire WW

Copper & Aluminium Foils

SynShield®

Insulate

Insulating Materials

SynTherm®

Electrical Adhesives Tapes

SynTape®-Intertape®-Isotape®

Electrical Insulating Sleeving

SynSleeve

Resins & Varnishes

SynChem

Stamped & Shaped Components

SynPrep

Wrapping Tapes

SynWrap

Connect & Equip

Connecting Cables & Transformer Terminals

SynCon®

Temperature Monitoring

SynTemp®

FRP Profiles

SynProf

Special Components & Accessoires

SynParts

SynFlex Group

Laboratory Services & UL Services acc. to 1446

SynLab®

Consulting & Services

SynServ

SynFlex International

Common Goal – Joint Progress:
The Resource of Power.



Insulation Systems, www.synflex.com



Magnet Wires, www.sh-wire.de



Electric Insulation, www.isotek-gmbh.de