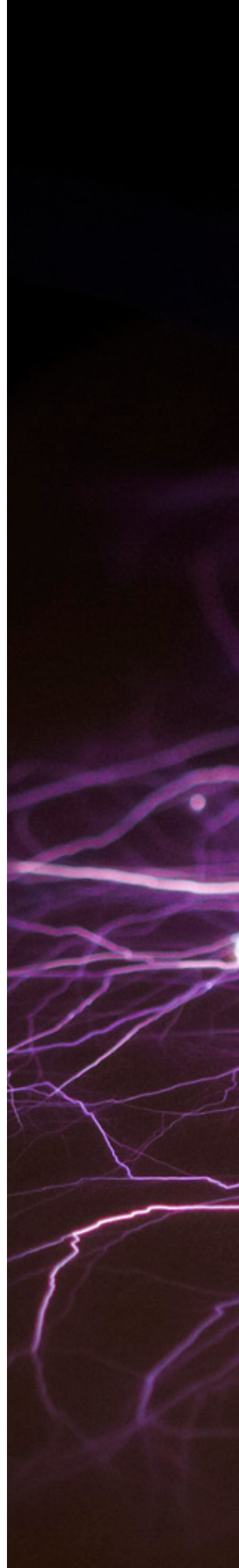


# SynFlex Group Services

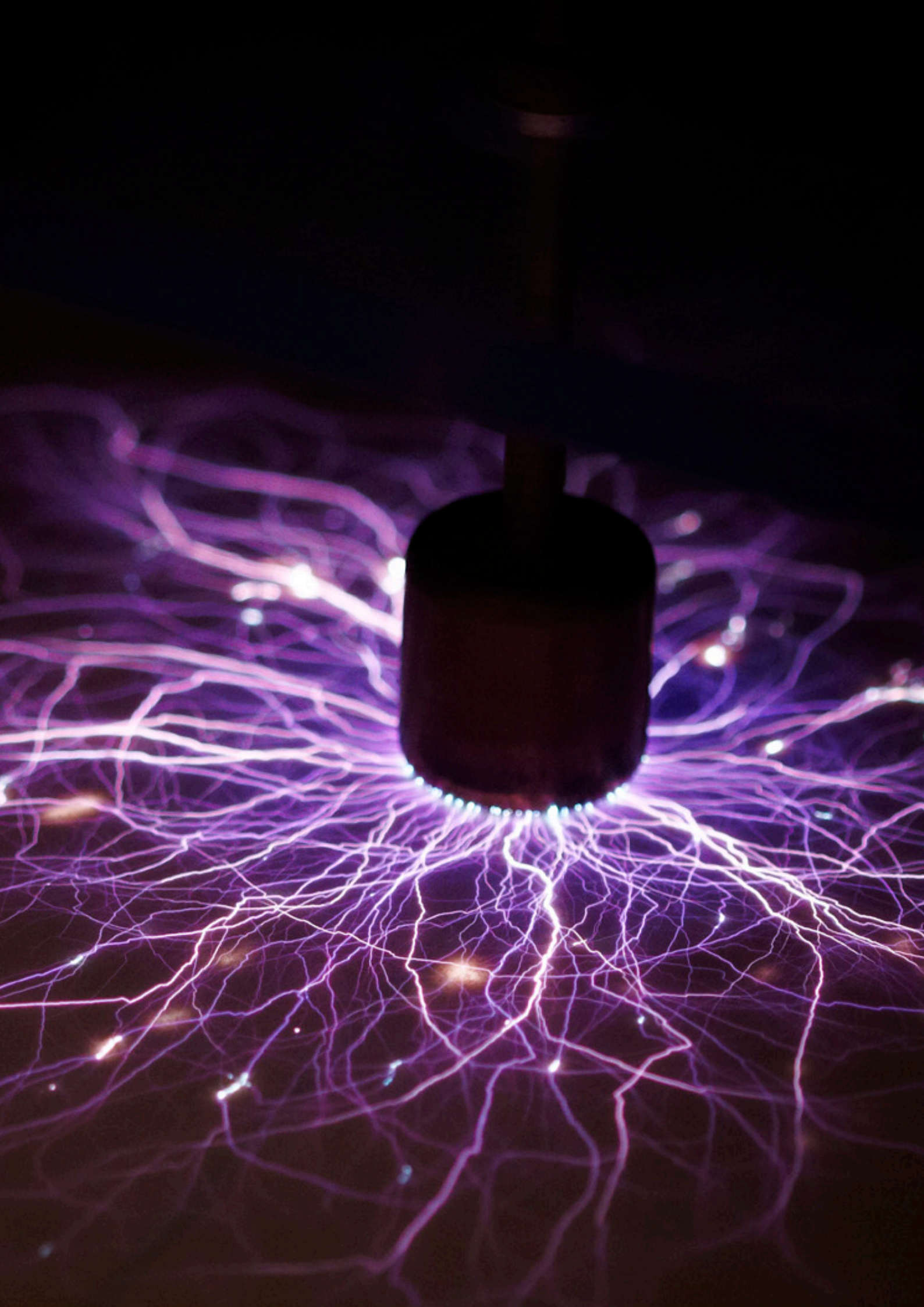


# SynFlex Group Services

In addition to the company-specific product range of SHWire, SynFlex and IsoTek, the SynFlex Group offers all customers interdisciplinary services to which they have access at all times. These run the gamut from comprehensive laboratory services at various locations under the SynLab® brand, right down to individual consultations and services from the SynServ product range. 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 & 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 only test laboratory in Europe accredited by UL, the SynLab® carries out all the tests required for the enhancement and new configuration of an EIS. These include endurance tests (FTA, DLFA), system enhancements (CCT), adaptation of existing systems, as well as material-specific individual tests that are carried out according to UL standards.

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 are a testimony to the quality of our range of services.

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

**As the only UL laboratory in Europe, we offer the following tests according to UL 1446:**

### **Endurance tests (Full Thermal Aging – FTA)**

- 1-temperature test
- 2-temperature test
- qualification of enameled wire (UL)
- qualification of enamels and resins (UL)

### **System enhancements (Component Compatibility Test – CCT)**

### **System adaptations**

#### **SynFlex insulation systems**

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

### **Compatibility tests**

# Highlights

## UL Defined-Life-Thermal-Aging (DLTA)

The new certification program is for electrical insulation systems used for applications in which the operative service life is specified at 5,000 hours or less. This enables developers and designers to evaluate and develop an EIS that is „reasonable“ for the anticipated use and not overengineered.

The DLTA program uses the UL 1446 system of insulation materials as the primary standard.

The IEC 61857 part 31 provides for 2 primary test methods:

- One-Temperature Aging: An individual set of samples is aged at 10 °C above the desired thermal classification.
- Two-Temperature Aging: Two sets of samples are aged at different temperatures, typically at 20-30 °C for one set and 30-35 °C above the desired thermal classification for the other set.

### Certification

After completion of a DLTA program, a Sealed Tube Chemical Compatibility Test (CCT) project can be launched, to add non-electric insulating materials (NIM) such as sleeveings, bandage tapes or sealing compounds, not to mention EIMs such as laminates, e.g.



# The SynFlex insulation system

## Class H (180 °C)

### As a unique EIS system

With its proprietary electrical insulation system according to thermal class H (180 °C), SynFlex offers a unique product, guaranteeing our customers the highest level of variability!

#### **Various types of enamelled wire**

Copper & aluminum / round & flat, Class 200/220, enamelled wire

#### **Wrapped wires**

Bare and enamelled wires with materials covered with ground and inter-winding insulation, taking into consideration the specified minimum thickness

#### **Plastics**

16 high-quality plastics made of 12 material groups, from diverse manufacturers in ground and inter-winding insulation

#### **SynTherm® products**

High-quality insulation materials, in line with market prices, as electrical insulation material (EIM), especially the SynTherm® products (YT family; PI film) and the resulting SynTherm® laminate combinations.

#### **Impregnating resins**

52 impregnating resins derived from 12 material groups from 4 manufacturers well-known in the market.

#### **Lead Wire variants**

SynTex® 155 UL  
XLPE/XLPO (BETAtherm® 155 UL)  
Silicone cable 200 °C  
PTFE litz cables 200 °C

#### **Sealing compounds**

7 sealing compounds from 3 manufacturers

#### **Insulating sleeving**

7 sleeving variants

#### **Winding and adhesive tapes**

6 winding tape variants and 44 adhesive tapes of various specifications

#### **Additional materials**

Mylar® & Teonex® as non-electrical insulation material (NIM) and fiberglass reinforced profiles



# 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.

- a point of contact as a link to UL
- avoidance of language barriers
- acceleration of communication and handling
- many years of experience with and superb contacts to UL
- savings of resources/costs
- specific product know-how
- access to a vast inventory of samples involving 25,000 standard items
- system expertise as support in project implementation

# 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.

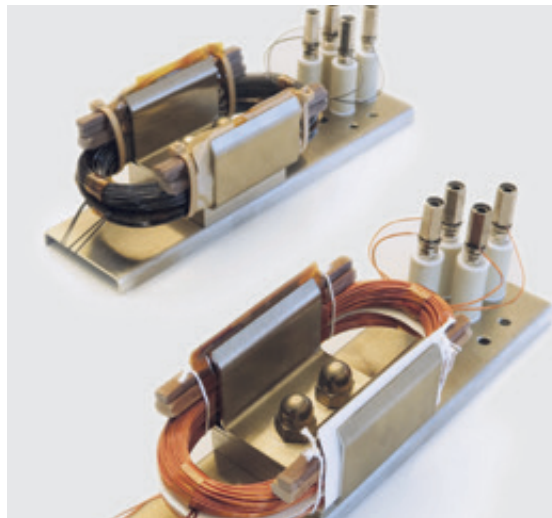
In the SynLab®, tests are conducted not only on the interactions of various components of the electrical insulation system as part of UL, but also on selective and long-term impacts of products and product groups.

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® 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







# SynServ

## Logistics competence

Rapid and reliable availability of goods is the core objective of logistics in the SynFlex Group. This is provided by the fully-automatic high-bay warehouse with 21,000 euro pallet positions. It usually takes less than 60 minutes for an order to be processed – from prompt acceptance to order picking in the warehouse. This is achieved thanks to our electronic data flow, barcode-based goods movement, packaging and shipping streamlining and optimized transport routes.

The fully-automatic high-bay warehousing technology is continuously self-optimizing. This self-learning technology enables us to handle up to 300 positions per hour. The products requested from the merchandise management system are routed as required to the material flow line, several hundred meters long, to be assembled, packaged, weighed and dispatched in the shortest possible time at the order picking stations.

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.

In addition to the purely logistical service, the SynFlex Group also offers customized individual solutions for its customers.

- customer-specific warehousing of products
- individual packaging solutions
- comprehensive standard range of labeling solutions
- high availability of merchandise in the standard range at locations in Europe, Asia and Turkey
- 25,000 standard products and 15,000 customer-specific products
- largest warehouse for round and flat enameled copper wires in Europe





## SynServ 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.

Our experts monitor not only the developments on international markets, they also provide impetus for new developments that can be harnessed by our customers. Based on these assessments, where necessary, we invest in new machine technologies or in the expansion of the machine park, based on individual customer needs, to meet the challenge on the customer's side.





# SynServ

## 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 the following services alongside the material supply of copper and aluminum:

- provision with the latest market data and commodity exchange information
- individual consultation on the topic of copper hedging
- precisely-tailored hedging offers
- handling and recycling of metal scrap

### Our experts

Born in 1969, Michael Wieland holds a degree in economics and worked from 1995 to 2002 as a metal trader where he dealt with metals including copper, zinc and tin. He has been part of the SynFlex and SHWire metal trading expert team since 2002.

Hermann Vauth was born in 1978 in Brakel, Westphalia and, following his qualification as a bank clerk, he studied economics in Paderborn. Since completing his studies in 2006, he has been a member of the SynFlex and SHWire metal trading expert team.



Michael Wieland and Hermann Vauth are happy to advise you on all aspects of metal trading



### Material supply with copper cathodes at real-time prices for cable, wire and semi-finished goods

- proximity to the commodity exchange through real-time prices
- strategic ability to influence the transaction
- complete flexibility in the allocation of the copper credit balance

### Copper price hedging via fixed-price transactions

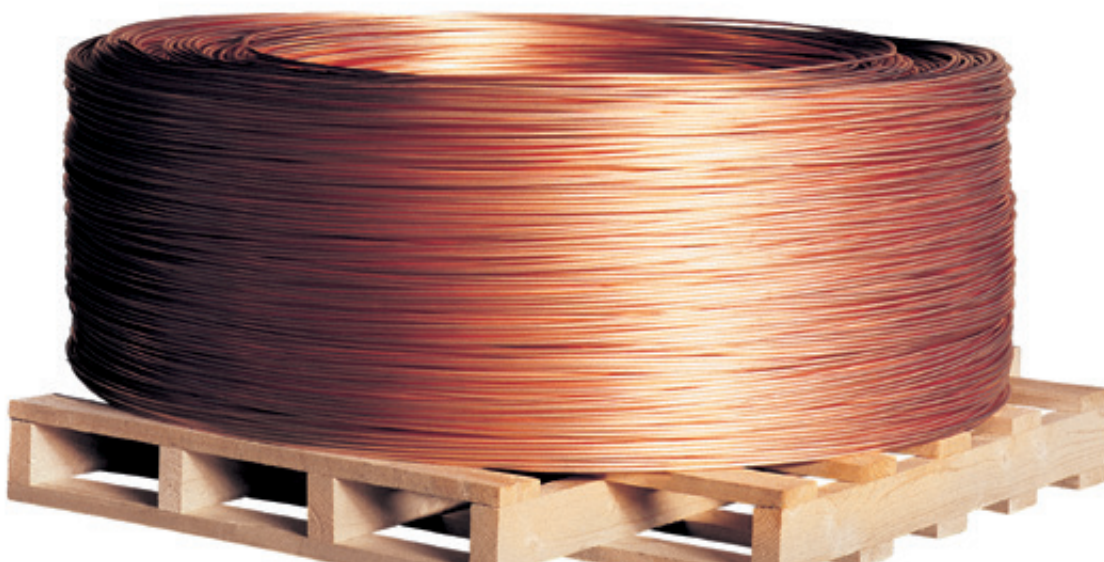
- time flexibility of the call-off order for copper
- billing occurs only upon delivery of the enamelled wire
- no advance commitment of liquidity
- identical payment terms of raw material and price without metal
- no inclusion of the copper in the inventory

### Copper price hedging via forward transactions

- copper price hedging of the medium- to long-term demand
- certainty of a fixed calculation base
- no advance commitment of liquidity

### Scrap management

- direct recycling into the customer-specific demand management for copper and aluminum
- return and processing of copper scrap of the following grades:
  - bare bright copper scrap/mill berry
  - enamelled copper wire scrap
  - copper refinery material
- purchasing of copper scrap or conversion of copper scrap into blister copper at attractive conditions



# SynFlex International

With production and logistic capacities in operation for you worldwide

The network of the SynFlex Group guarantees you consistent quality of the service and products, goods availability and professional advisory. 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 location, 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**

With our location in Vienna, in addition to covering the Austrian market, we also handle the entire Eastern European region of Czech Republic and Albania, all the way to 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, South and Eastern Asia.







Common Goal – Joint Progress:  
The Resource of Power.



#### Insulation Systems



SynFlex  
Elektro GmbH

Auf den Kreuzen 24  
D-32825 Blomberg  
Telefon +49-5232-968-0  
Telefax +49-5232-968-222  
info@synflex.de

#### Magnet Wires



Schwering & Hasse  
Elektrodraht GmbH

Pyrmonter Straße 3-5  
D-32676 Lügde  
Telefon +49-5281-988-0  
Telefax +49-5281-988-119  
info@sh-wire.de

#### Electric Insulation



IsoTek GmbH

Nordstrasse 32  
D-74219 Möckmühl  
Telefon +49-6298-937-53-0  
Telefax +49-6298-937-53-15  
info@isotek-gmbh.de