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CIRCUIT FOIL LUXEMBOURG AND LIST SIGN €18 MILLION PARTNERSHIP

CIRCUIT FOIL LUXEMBOURG AND LIST SIGN €18 MILLION PARTNERSHIP TO WORK FOR 4 YEARS ON THE NEXT GENERATION OF COPPER FOIL

A deal that is set to be the largest public-private partnership ever signed between a mid-sized Luxembourg company and a public research centre supported by the Ministry and the Minister of Economy, the National Research Fund and the Ministry of Higher Education and Research.

The Luxembourg Institution of Science and Technology (LIST) and global company Circuit Foil, owned by Solus Advanced Materials, based in Wiltz, launch a new exciting and massive R&D collaboration in a partnership to research and deploy the next generation of copper foil for various growing markets. Among other, this includes 5G and 6G communication, copper composite materials for aircraft, and advanced material solution of current

collectors for lithium-ion batteries entering in the rapid growth of electric vehicles in Europe.

Having worked together already for the past four years to research and develop a new family of copper-based materials, LIST and Circuit Foil are signing a new contract together to take this research to another level aiming at copper foil production for markets driven by the digitalization and electrification technologies.

This partnership will prove to be a strategic positioning for Luxembourg and Europe as Circuit Foil is, together with its sister companies in Hungary, the only copper foil manufacturing companies in Europe. It will also lead to joint intellectual properties which will help place Luxembourg as a high-tech country into a domain becoming more and more strategic for the European strength.

The collaborative research project is structured around two major R&D programmes:

- Programme 1: Copper materials for electronics and emerging applications
- Programme 2: Materials for energy, transport and advanced materials

5G and 6G

The development of electronics is always remarkable and rapid. In the field of communication, the implementation of 5G will be the challenge of the next 5 years while preparing the emergence of 6G. It is now recognised that more and more connected objects will be part of our daily lives. These connected objects will require an increasingly high flow of information. These future information rates will require major modifications to the printed circuits to pass electrical signals at very high frequencies: this concerns both 5G antennas and carrier frequency reception devices.

Circuit Foil plans to produce ultra-thin copper foil leading to ultra-low loss of electronic signal that enables 5G and 6G communications.

Electric vehicles

The field of electronics applied to transport is driven by the emergence of semi-autonomous and electric vehicles. The market is developing around (a) LIDAR / RADAR systems for which data transmission speeds are also increased and (b) new generations of batteries with high storage capacities and low weight. These two trends represent important new market opportunities for Circuit Foil and upstream research should be stepped up to develop new complex copper strips that are thinner, lighter, more mechanically resistant and more electrically conductive.

Aircraft lightning protection

Research around complex copper products should enable Circuit Foil and LIST to offer the most advanced lightning protection systems to the aeronautical and transport markets. Indeed, the integration of ultra-light composite materials in new generation aircraft and in future vehicles, is accompanied by degradation of lightning barrier properties. Current technology is based on the installation of copper foils (or copper foil grids) that are efficient but still too heavy for the giants of the sector. Therefore, research into copper-carbon nanostructure composite materials is one of the most promising avenues for meeting these technological challenges. According to recent studies, 100kg less on an Airbus A320 represents savings of 10,000L of kerosene, thus illustrating,

beyond the reduction in CO2 emitted, the gain and the economic value of ultra-conductive and ultra-light materials.

What will this collaboration bring?

To address various markets, Circuit Foil needs to invest significantly into the development of new copper foil products driven by the miniaturisation for electronic devices. This is an area LIST can help to collaborate in developing this new product.

Working together allows Circuit Foil to improve their manufacturing efficiency by researching advanced processing technologies together with LIST.

Indeed, it is forecast that the demand for copper is set to increase in the coming years. "From now to 2030 demand will increase in volume by 2.5 so that illustrates clearly how much pressure there will be on copper as a resource. Large research investment on advanced copper foil technologies and manufacturing is instrumental to help our strategic partner, Circuit Foil, to capture fantastic market perspectives serving the digitalisation and the sustainable transformation of our society", stated LIST's Director of the Materials Research and Technology Department Damien Lenoble

"Circuit Foil has a history of experience in development of high-quality electrodeposited copper foils for the electronics industry. Our copper foil is a key component in a wide range of applications such as smartphones, 5G devices, IoT, smart cards, autonomous vehicles, airplanes or satellites! While environment is a global concern, Circuit Foil is at the forefront of circular economy while using 100% of recycled copper as raw material. Being part of Solus Advanced Materials, the company participates in reducing CO^2 emission with a foil for batteries in EVs and energy storage applications", explained Fabienne Bozet, Circuit Foil CEO.

With the support of the Ministry of Economy, FNR and the Ministry of Higher Education and Research, the budget of the LIST – Circuit Foil strategic R&D partnership is €18 million over 4 years.

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