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PRESS INFORMATION

Saubermacher opens new high-tech recycling plant for lithium-ion batteries

The plant has been installed at Saubermacher Group company Redux Recycling in Bremerhaven (Germany). Saubermacher and Redux have jointly been researching and developing processes and technologies for many years. The plant is capable of processing all types of lithium-ion battery and has an annual capacity of 10,000 tonnes. The innovative process will allow Redux to achieve recycling rates that are as much as 40 %¹ above the statutory target values. The level of investment in the plant was around three million Euros.

Raw material extraction 2.0. In their composition, lithium-ion batteries are highly heterogeneous and have a high energy value, even at the end of their service lives. This fact alone makes recycling particularly complicated, and necessitates high standards of safety. Saubermacher and Redux use a time-consuming, multi-stage process that involves a sorting line and mechanical processing, a process developed by Saubermacher itself through intensive research. “We achieve higher recycling rates when compared to other methods. At present, we’re achieving around 60 % to 70 %”, explains Gerhard Ziehenberger, COO of Saubermacher AG. The process recovers important secondary raw materials such as stainless steel, aluminium, copper, plastic and active materials. The energy obtained from the batteries in the discharge process is fed into Redux’s own grid.

Global growth market. Quantities of lithium-ion batteries (disposable and rechargeable) are growing at double-digit rates, but return rates for old batteries remain low. “We’re expecting some 2000 to 3000 tonnes of old batteries annually over the coming years”, explains Ralf Mittermayr, Spokesperson of the Board and CMO of Saubermacher AG. “The plant has an annual capacity of 10,000 tonnes, so we’re well prepared for the quantities that we expect to see around the globe”, explains Hans Roth, Chairman of the Supervisory Board and Owner of Saubermacher.

¹ The calculation involves a wide variety of information. The basis comprises the disassembly results, mass balances of thermal treatment and mechanical processing as well as characterisation of the final fraction sizes obtained. The statutory target values in many countries, e.g. Austria and Germany, are 50 %.



Synergies and logistical advantages were crucial to the integration of the plant at the Bremerhaven site, and have helped to secure the site for the long-term. The site has previously been engaged in the processing of conventional batteries. All in all, Saubermacher has invested more than ten million Euros in battery recycling in the past two years.

Raw material extraction 4.0. The path from the idea to the scale model took six years. An additional two years were needed to actually realise the large-scale plant. But the goal is still some distance away. "Our vision is zero waste, so in the long-term, we're aiming for a recycling rate of 100 %", continues Ziehenberger. Working with technology partners like AVL List GmbH, the internal R&D team takes various approaches, such as using used battery systems as storage media, an idea that won Saubermacher the Energy Globe Austria Award in the spring.

Photo 1



Ralf Mittermayr, Speaker of the Executive Board, CMO Saubermacher, Hans Roth, Company Founder and Chairman of the Supervisory Board Saubermacher, Gerhard Ziehenber, Member of the Executive Board, COO Saubermacher, (left to right), photo credit: Saubermacher

Photo 2



Recycling plant for Lithium-Ion Batteries in Bremerhaven, photo credit: Saubermacher

Back-up recycling details. Battery recycling generally involves four stages.

- Discharge. In the first stage, the battery systems are identified, assessed and discharged. The high energy value (electric vehicle storage systems, for example, have voltages of up to 700 V) necessitates a full discharge. The energy obtained is fed back into Redux's own grid.
- Disassembly. The energy storage systems are then dismantled by hand. Given the wide variation in sizes and types, this is the best way to achieve the highest output of secondary raw materials. Depending on the type of battery, this process takes between twenty and more than sixty minutes and yields plastics, aluminium or electronic components.
- Thermal treatment. The cells of the batteries are then deactivated with a special thermal treatment process, releasing the coating of the electrode conductor foils and removing the separator and electrolyte. This time-consuming process can yield materials including aluminium foils.
- Mechanical processing. The final stage seeks to recover as much material from the cells as possible, including stainless steel, copper or active materials. The composite material is firstly released and the active materials are then isolated directly in a process step. This is followed by sieving and magnetic separation to yield a ferromagnetic fraction, an Al fraction and an Al-Cu fraction. The recovered materials are fed into pyrometallurgical and/or hydrometallurgical processes, thereby returning them to the raw material cycle.



About Redux Recycling GmbH

Founded in 1997 just outside Frankfurt, Redux Recycling GmbH is a market leader in primary device battery recycling and has more than two decades of experience in the processing of battery components from the electric mobility sector. Its two sites in Offenbach am Main and Bremerhaven can jointly process up to 46,000 tonnes of batteries annually. Proprietary technical developments have enabled Redux to offer a complete range of battery recycling services, from sorting to recovery. The company employs around 80 employees and counts battery return systems from more than 20 countries as its customers. Austrian recycling company Saubermacher has owned Redux since 2016. Further information can be found at <https://www.redux-recycling.com>.

About Saubermacher AG

Saubermacher Dienstleistungs AG is an international disposal and recycling company based in Feldkirchen bei Graz. The family company was founded in 1979 and is a competent partner for approx. 1600 municipalities and over 40,000 businesses. The company employs some 3050 employees in Austria, Germany, the Czech Republic, Slovenia, Hungary and the UAE. With its “zero waste” vision, the environmental pioneer is seeking to increase processing of materials so that at the end of a product’s life cycle, ever increasing quantities of material are sent for recycling, leading to an (almost) unending cycle of reuse. Further information can be found at www.saubermacher.at

Queries

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