

Trade Mission E-Mobility Battery Production & Battery Recycling

Germany - United States of America Detroit & San Francisco, Sept. 30th – Oct. 4th, 2024



Organizer



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About the Trade Mission

On behalf of the German Federal Ministry for Economic Affairs and Climate Action (BMWK), Trade Horizons Ltd. is organizing a Trade Mission to Detroit and San Francisco in cooperation with various German and American trade associations. This Trade Mission is part of the **Export Initiative Environmental Technologies** of the BMWK.

The delegation consists of ten selected German companies that specialize in technologies and services in the fields of E-Mobility, Battery Production and Battery Recycling. The delegation will be in Detroit on Sept. 30th and Oct. 1st and in San Francisco from Oct. 2nd to 4th. The companies are visiting the regions to learn about the sectors in the United States, share their technology and develop strategic relationships with relevant companies. The aim of this delegation trip is to establish new partnerships and cooperations with American companies as well as to develop market entry strategies for the German companies and to meet business and trade partners.

The Federal Ministry for Economic Affairs and Climate Action as client and Trade Horizons Ltd. as organizer cordially invite you to get to know our German delegation participants and engage in B2B activities.

The German companies will present their products and technologies and will be available for business meetings and extensive networking. The delegation is also interested in learning interesting and up-to-date information about the American market from local players and market experts as well as exploring opportunities for German-American cooperation.

Feel free to contact us and arrange individual meetings with one or more of the following German companies! We are happy to answer any questions you may have. If you are unable to attend during the week of the Trade Mission, we can help you set up a personal or digital meeting in the future.



The Trade Mission is accompanied by **Ms Sandra Matk**, **Consultant budget coordination for industrial policy and transformation programmes**, from the Federal Ministry for Economic Affairs and Climate Action.

Tel: +49-30-18615-6461 E-Mail: <u>Sandra.Matk@bmwk.bund.de</u>

Message of greeting from the Foreign Market Entry Programme



Mr. Christian Tippelt

Director Foreign Market Entry Programme of the Federal Ministry for Economic Affairs and Climate Action (BMWK)

Germany Trade & Invest

The Foreign Market Entry Programme assists German Small and Medium-Sized Businesses during all stages of their export activities. Participating businesses receive widespread support from the initial stages of market exploration up to the making of actual business contacts, e.g., by providing first-hand market information, organizing exploration trips and building networks. Key element of this support is the personal assistance during preparation, implementation and follow-up of these measures to ensure that the business arrangements are of high quality and sustainable.

This visit is part of the initiating business opportunities module of the Foreign Market Entry Programme and will facilitate business contacts as well as provide important impulses for the further intensification of the fruitful co-operation between the United States and Germany.

On behalf of the German Federal Ministry for Economic Affairs and Climate Action, I would like to thank the participants from Germany, all multipliers, and other involved parties in the United States for their contribution to create a successful measure.

Organizing Team: Trade Horizons Ltd.

Trade Horizons is an award-winning market entry company, assisting ambitious companies to identify, develop and grow sustainable revenues in new geographic markets. We offer support to clients in international strategy development for their global business growth, and throughout the key phases of market entry execution – Preparation, Launch and Growth. We assist with all aspects of market entry by providing the local, specialised end-to-end knowledge, skills and expert support required to help companies establish their business successfully and fast. We connect our clients with the local support they need to assess the market successfully, taking full advantage of market opportunities. Tailored expert assistance is available at every stage.



Mr. Richard Biggs, Director North America

Richard Biggs is a global business development executive with over 25 years of international experience spanning diverse industries, economies and cultures. He is a skilled and agile strategist who has helped companies ranging from start-ups to multinationals perform successful market entry and long-term growth. He is an approved US Department of Commerce business mentor.

Mr. Zachary Person, Associate Consultant USA

Zach has launched products and services in the U.S. and in markets around the world. This has included projects such as managing entire global sales and marketing departments. This background allows Zach to work shoulder to shoulder with everyone from admin staff to process engineers to presidents and CEO's. Industries include metal fabrication, manufacturing, medical device, automotive aftermarket, general aviation payment systems and marine engineering services.





Mr. Erik Adair, Associate Consultant USA

Erik brings 20 years of experience in government, international trade and business development, which he backs up with a B.A. degree in international studies and an M.A. degree in international business. His career has taken him from the US to the UK, China and Vietnam, including six years living in Ho Chi Minh City working in technology and logistics.

Ms. Ceren Ozturk, Associate Consultant - USA/Turkey

Ms Ceren Ozturk is an experienced business developer with a strong track record in driving the success of various businesses. Specialising in remote operations, she has successfully led business development initiatives in the EMEA region, USA, Canada and Australia. Ceren has strategic vision, market knowledge and a proven ability to cultivate valuable partnerships.





Ms. Miriam Achenbach, Associate Consultant - Germany/Italy

Ms Miriam Achenbach is an experienced tender and project manager for internationalization and market entry projects (especially Italy and D-A-CH). She has almost 20 years experience working on behalf of the Federal Ministry for Economic Affairs and Climate Action (BMWK) and Germany Trade & Invest (GTAI) and has organized and coordinated more than 100 projects on all continents.

Ms. Vanessa Dal Busco, Digital Marketing und Social Media

Ms Vanessa Dal Busco is an experienced Marketing Specialist with a demonstrated history of success in Information Technology and Services, and in Finance and The Arts. She is a strong business development professional skilled in Marketing, Social Media, Lead Generation, Negotiation, Business Planning, Sales, Market Research, and Management.



German Companies

The following German companies are participating in the Trade Mission to Detroit and San Francisco. After the following 2-page overview you can find the detailed profile of each participant, in alphabetical order.



Circunomics GmbH: li-ion battery lifecycle management technology!

Circunomics offers the first analytics-based, digital marketplace for the circular economy with a clear focus on the use of used batteries, modules and cells in the context of 2nd life reuse and recycling.

Drei Bond GmbH: Adhesives, Dosing Systems, Services!

:) DREI BOND

DREI BOND is a one-stop supplier of cutting-edge industrial adhesives, dosing systems as complete solutions, and comprehensive engineering & after-sales services for the automotive industry, machine/plant construction as well as for all manufacturing companies worldwide.



EAS Batteries GmbH: High performance cells!

EAS is a manufacturer of large format cylindrical Lithium-Ion cells and battery systems, which are used in particular in the aerospace, aviation, marine and automotive sectors.



Emil Motors GmbH: Sustainable drive units!

Electric motor technology without rare earth metals (prototyping and simulation work). We can develop, test and manufacture electric motors specifically for all applications from 20kW to 1000kW.



HECHT Technologie GmbH: Bulk material handling!

Producer of machinery for bulk material handling in chemical and pharmaceutical industry. The main equipment is for filling and discharging vessels like Big Bags, Sacks, Drums, but also dosing, pneumatic conveying and sampling are part of the portfolio.



Hosokawa Alpine AG: Recycling of battery production scrap for direct reuse!

Hosokawa Alpine designs and builds process technological machines and systems for processing powders, granules and bulk materials as well as for manifold recycling jobs. We also offer solutions for compacting technology and laboratory equipment for particle analysis.

PEM Motion GmbH: Battery Engineering and Consulting Services!



PEM Motion is a German provider of engineering and consulting services in the field of clean mobility solutions. PEM Motion advises its clients in the fields of E-Mobility components and their developments, i.e. battery & e-motor development, prototypes, and others.



Raylase GmbH: Laser technology!

Regardless of your industry or sector, be it automotive, renewable energy, aerospace engineering, textiles, packaging, or electronics, you benefit by making use of both our technologies and our core competency in laser material processing.



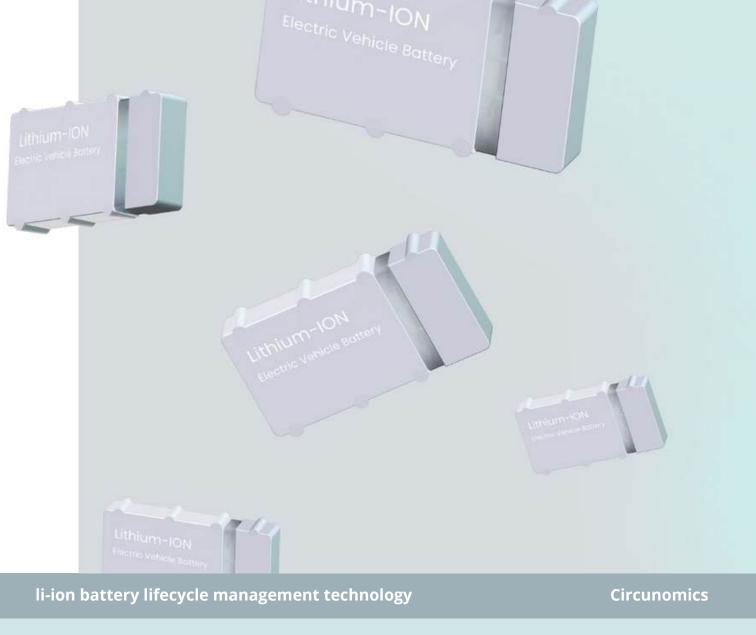
Reckelberg Environmental Technologies GmbH: Environmental Technologies!

RET develops and supplies key-components and turnkey line solutions covering the complete recycling process, from battery to black mass, for all kinds of Lithium-Ion batteries and scrap-fractions from the battery production.



Sonplas GmbH: Planning, assembly and service of special machines!

Special machine manufacturer active in the automotive, battery, hydrogen and special assembly and testing sectors.







Große Bleiche 15, 55116 Mainz, Germany

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+49 6131 6362460



www.circunomics.com

CO circunomics

Company

Circunomics offers the first analytics-based, digital marketplace for the circular economy with a clear focus on the use of used batteries, modules and cells in the context of 2nd life reuse and recycling.

Products and Technologies

We offer unique opportunities: In addition to the trade of used battery packs, modules and cells, the intelligent analytics of 1st life use (state of health) and a simulation of future, individual 2nd life use is our core USP. The AI-supported technology provides far more information than the historical data available today from suppliers of used batteries and the future battery passport under the European Battery Regulation. For the US market we would like to introduce our digital battery lifecycle management solution.

Strengths

We turn waste (batteries) into value by creating a true circular economy. Our technology helps to identify the remaining capacity in a battery in order to facilitate the use of this capacity in 2nd life apllications (mainly stationary energy storage solutions). To close the loop we also integrated the recycling process at the end of life of a battery into our solution. Key differentiator is that our B2B marketplace for the trade of assets is intelligent as we provide analytics to the assets we trade. All our competitors simply list batteries on their marketplace but very often they don't provide any kind of transparency on health status for those assets.

Target clients

Utilities, Energy Storage System providers (B2U, Moment Energy), Automotive OEMs, Recyclers, Scrap Yards, Cell Manufacturers, Partly State Governments as they sponsor a lot of energy storage projects that are currently under development







ADHESIVES, DOSING SYSTEMS, SERVICES

DREI BOND GMBH



Carl-Zeiss-Ring 13 85737 Ismaning/Munich Germany



info@dreibond.de



+49 (89) 962427-0



www.dreibond.de



Since 1979, Drei Bond GmbH from Ismaning near Munich has impressed the market as a one-stop supplier of cutting-edge industrial adhesives, dosing systems as complete solutions, and comprehensive engineering & after-sales services for the automotive industry, machine/plant construction as well as for all manufacturing companies worldwide. We accompany customers from the planning, development, validation to the series production process and contribute to the sustainable strengthening of their competitiveness.

Products, technology and services

- Adhesives & Sealants (flange sealants, thread sealing, structural/flexible bonding, etc.)
 - Services (consulting & application development, chemical development & modification, bonding of prototypes/small series parts, trainings)
- Dosing Systems (standardized and on demand; adhesive & sealant application, oiling systems, greasing systems, fully automated systems, etc.)
 - Services (commissioning, repair/maintenance, engineering, spares, trainings)

Strengths

- Full solution provider for value-added bonding
- More than 45 years of experience, knowledge and flexible project management
- in-house teams: application technology, mechanical/electronical/engineering, services
- Appealing product portfolio
- Large customer base, many different customers & sizes

Target clients

- Technical development e-drives/motors
- Technical development batteries/fuel cells
- Specialists in the fields of joining technology/bonding technology
- All manufacturing companies with adhesive applications





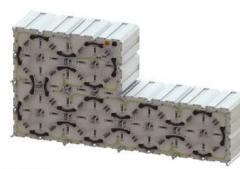
Value Chain coverage – along knowledge and experiences Example: EASy Marine[®] - Developed to your requirements

System

integration Partner and EAS







High performance cells

System

requirement

Customer (shipyard,

integrator) and

EAS

System layout

Partner (shipyard) and EAS

Application

requirement

User, ship

operator

EAS Batteries





Module

EAS competence made in Germany

Battery

layout

BMS, cooling, electrical layout EAS

> EAS Batteries GmbH, Lokomotivenstraße 21, 99734 Nordhausen, Germany

Material EAS supplier – more than one

internally certified supplier for each critical material

Cell

EAS competence made in Germany



+49 3631 467030

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www.eas-batteries.com



www.eas-batteries.com



EAS Batteries GmbH develops and manufactures large format cylindrical Lithium-Ion cells and battery systems, which are used in particular in the aerospace, aviation, marine and automotive sectors. Thanks to the flexibility of an own prototype and small series production line, EAS can also adapt its products to special customer requirements and is the ideal partner for customized battery cells and systems for non-standard requirements.

Products and technologies

- Li-Ion Battery cells (various cylindrical ferments and characteristics)
- Customised Battery Systems (various markets)
- Development Services (Cell, Battery)
- Analyses & Testing

Strengths

- 25 years of experience in Li-Ion cylindrical cells
- Strong technology + IP base (incl. Battery Management System)
- Vertically integrated (from Cell to System)
- Know how to support / speed up our clients business
- Sustainable Technology

Target clients

Anyone who need support in specific cell and battery solutions.





Our flagship

250 kW

600 Nm

SHAFT POWER

PEAK TORQUE

>97%

30kg

Motor efficiency

Motor weight

Sustainable drive units

Emil Motors



powering the next generation



Michael-Wolgemut-Weg 10, 91217 Hersbruck



m.guettinger@emil-motors.com



+49 172 7621573



www.emil-motors.com



We offer a strong team with years of experience in the electric motor and manufacturing world. Together with our investment partner and other partners we can develop, test and manufacture electric motors specifically for all applications from 20kW to 1000kW. Emil Motors itself is a young start up. We use the experience of our partners in the fields of mass manufacturing and industrialization to bring our product to reality, focusing on high quality and cost reduction.

Products and Technologies

Our axial flux induction motor technology enables electric motors without rare earth magnets. It is suitable for electric vehicles due to the high torque and power density. No existing technology without rare earth metals can offer these specifications. In stark contrast to other competing rare earth free motors, we do not need more expensive power electronics or other expensive materials. Our motors are much cheaper compared to the "state of the art" whilst offering superior performance.

Strengths

Our motor is completely free from rare earth magnets and offers the highest level of independence from foreign markets. The only materials found in our motor are Copper, Aluminum, Steel and plastics. With our high performance oil cooling, the motors runs cooler and lasts longer, reducing scrapped motors. Rare earth free motors from competitors often compromise on efficiency, often resulting in peak efficiencies of just 95% in the motor. Low energy consumption is paramount for an efficient and sustainable economy. Our motor can reach peak efficiencies of 97-98%, resulting in low energy consumption and getting very close to rare earth magnet performance.

Target clients

Automotive companies/suppliers, utility vehicle manufacturers, recreational electric vehicle manufacturers, electric motor manufacturers, power electronic companies.





LEADING IN POWDER HANDLING FOR BATTERY PRODUCTION

Hecht







Gewerbegebiet An der Trabrennbahn, Schirmbeckstraße 17, 85276 Pfaffenhofen an der Ilm, Germany

+49 8441 89560



info@hecht.eu



www.hecht.eu



Hecht is producing machinery for bulk material handling in chemical and pharmaceutical industry since more than 45 years. The main equipment is for filling and discharging vessels like Big Bags, Sacks, Drums, but also dosing, pneumatic conveying and sampling are part of the portfolio.

Products and Technologies

Hecht specialises in the construction of containment systems for handling toxic, high-value and sensitive materials - but everything is also available in standard non-containment versions. For the US market we would like to introduce Containment handling instruments for cathode and anode materials

Strengths

Customized solutions for any kind of bulk solid handling: From the beginning of our corporate history, HECHT pursues one major goal: To develop an individual tailor-made solution for whatever kind of complex task of bulk solid handling. Your requirements, how specific they may be, are the daily incentive for our team of engineers. The result: highly innovative product developments, such as the ProClean Conveyor, the well-known HECHT conveyor system.

An extra benefit of efficiency and operator comfort: Bulk solids handling with HECHT systems means bulk solids handling PLUS: Besides the production process itself, we also draw our attention to your economic efficiency and the individual comfort of your employees. Cost reduction, increase in efficiency and high user-friendliness even for confined space conditions are key aspects when designing your systems.

Target clients

All companies in the chemical, pharmaceutical and food industries - from small businesses to international corporations. In the US we would like to meet Battery production companies, machine building companies (mixers, extruders, etc.) Raw material production.





Recycling of battery production scrap for direct reuse

Hosakawa Alpine



ALPINE ENGINEERED, MANUFACTURED & ASSEMBLED in GERMANY



Peter-Dörfler-Str. 13 – 25, 86199 Augsburg



recycling@alpine.hosokawa.com





www.hosokawa-alpine.de



For over 120 years now, Hosokawa Alpine has been designing and building process technological machines and systems for processing powders, granules and bulk materials as well as for manifold recycling jobs. The company has a comprehensive product portfolio – from mills and shredders to classifiers. Besides machines for size reduction, the powder and particle process technology business segment also offers solutions for compacting technology as well as laboratory equipment for particle analysis. The systems are employed in a host of different industrial branches. Every customer has individual requirements. This is why Hosokawa Alpine supports its customers as a system partner from the design and development stage right up to installation of the turnkey system.

Products and Technologies

- Equipment for recycling of battery production scrap for direct re-use in the mixing & coating process
- Equipment for high-performance cathode active material
- Equipment for Graphite and next gen anode material

Strengths

Own process and special designed equipment for battery recycling and production of performance materials. Key differentiators is our own designed process for e.g. Direct Scrap Recycling.

Target clients

As a machine supplier our customers are mainly producers. In the US we would like to meet Battery producers, Electrode Producers, Battery recycling companies.



PFM Motion Company profile

PEM Motion is a business consulting and engineering service provider focusing on batteries and electric motors as well as the industrialization of mobility products.



Battery Services at PEM Motion Competencies along the complete lifecycle



- Battery development process and requirements management
- Battery cell/system structure. design and prototyping
- Thermal/mechanical battery simulation
- Methodical battery testing (abuse and performance)

Battery Components & Recycling

- Battery characterization & disassembly
- Re-X: Refurbish, Re-Use & Recycling Battery components and
- design on cell, module and pack level Storage, handling & transport of batteries
- Battery Testing Battery Engineering Battery Production **Battery Materials** & Components Battery Battery Use Recycling & 2nd Use Battery Business Strategy Certification/homologation + Market analysis studies Market entry

Battery Production Technology Assessment of equipment costs for battery production + Technology benchmarking for electrode manufacturing, cell

assembly and cell finalization Process technology analysis for next generation batteries Industrialization and technology scale-up for Gigafactories

Battery Production Management

- + Production and factory planning for production lines Mini-environment concepts
- for clean and dry rooms Quality assurance and data management planning
- Production ramp-up support, and operator qualification and training concepts

Your advantage with **PFM Motion:**

- Pioneers in e-mobility • technology with over a decade of experience and more than 500 projects delivered globally, including Europe and North America
- Cutting-edge technical expertise and bespoke methods driven by a flexible team that aligns dynamically with project needs
- Extensive industry insights via global expert network including RWTH Aachen University and top industry experts



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Battery Engineering and Consulting Services

Technology roadmaps

+ Product strategy





+ Business modelling/planning

Bohr 12 D-52072 Aachen

+49 173 823 0423 (Germany) +52 444 216 2608 (North America)



info@pem-motion.com

PEM Motion GmbH



www.pem-motion.com

PEM Motion is a German provider of engineering and consulting services in the field of clean mobility solutions and a spin-off of



RWTH Aachen University. Throughout the last years PEM expanded globally, with offices in the USA, Canada and Mexico. PEM Motion advises its clients in the fields of E-Mobility components and their developments, i.e. battery & e-motor development, prototypes and their industrialization, production planning as well as the conceptualization and implementation of innovation ecosystems in the field of E-Mobility.

Products and technologies

Our main services around Battery Cell & System Technology include:

- Cell Thermal / Mechanical Simulation; Cell & System Development
- BMS Development
- Production Equipment; Production Planning & Management
- Components, Re-Manufacturing & Recycling
- Workforce Development & Training
- Business Strategy & Technical Due Diligence
- Market Entry & Analysis

Strengths

- Spin-off of RWTH Aachen University with strong ties to more than 200 e-mobility researchers & experts
- 10+ years of experience in EV batteries & production technology
- Focused on the industrialization of e-mobility products & drivetrain components
- Agile & dynamic teams in Germany, the US & Mexico, with distinct regional market & technology experiences

Target Clients

Battery Cell & System Manufacturers; European companies entering the US market; OEMs, EV manufacturers, start-ups and component suppliers, seeking operations support or individualized capacity developments; Public entities, industry clusters and associations with needs for workforce development partners; Battery Manufacturing Equipment Suppliers; Investors & VCs seeking technical support.











Laser technology





Argelsrieder Feld 2+4, 82234 Weßling, Germany



info@raylase.de

Raylase GmbH





www.raylase.de



As your partner in industrial production, we think in innovative solutions. Together with you, we make manufacturing processes more efficient and economical. That means production steps such as, for example, battery production in e-mobility, solar wafer production in photovoltaic, or additive manufacturing. Regardless of your industry or sector, be it automotive, renewable energy, aerospace engineering, textiles, packaging, or electronics, you benefit by making use of both our technologies and our core competency in laser material processing. We know your needs and make it our business to fulfill them. Our product portfolio consisting of laser deflection units, control electronics and state-of-the-art software allows you to process a wide variety of materials such as metal, plastic, paper, textiles, and many more, in a way that is more flexible, economical, and precise. Our opto-mechanical deflection units also offer you excellent image processing for better calibration, simple automation, and exact monitoring of your laser processes.

Products and Technologies

Laser material processing with opto-mechanical deflection units. For the US market we would like to introduce deflection units for laser material processing, software and control.

Strengths

Unique technology within laser material processing for the manufacturing of traction batteries, batteries, fuel cells and solar panels. Our portfolio is strong in hardware, I.e. optics for laser processing, and supplemented by software and control.

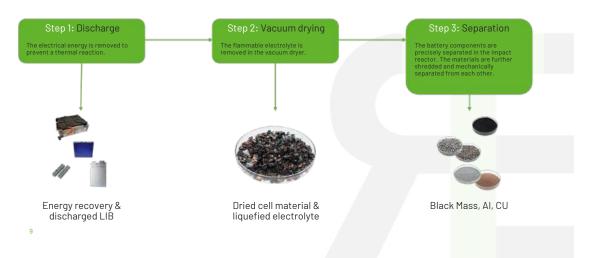
Target clients

Machine builder and integrators. OEMs in automotive and aerospace industry. In the US we would like to meet Battery cell manufacturing, electric motor manufacturing, solar cell manufacturing, fuel cell manufacturing.





FOR LITHIUM-ION BATTERIES



Environmental Technologies

Reckelberg

FE RECKELBERG ENVIRONMENTAL TECHNOLOGIES



Schleusenstr. 1, 27568 Bremerhaven



office@reckelberg.com



+49 471 941 85 900



www.reckelberg.com



RET develops and supplies key-components and turnkey line solutions covering the complete recyclingprocess, from battery to black mass, for all kinds of Lithium-Ion batteries and scrap-fractions from the battery production. Creating a highest quality black mass and purest fractions in all stages, while fulfilling and even exceeding all effective and upcoming recycling quotes as well as emission requirements (incl. TA-Luft).

Products and Technologies

Equipment for electrical deep-discharging with all required safety and security measures, including feeding back to the grid (efficiency approx. 96%).

Vacuum drying systems, including exhaust-gas treatment and Electrolyte recovery. Key-component (Impact Reactor) for treating the pre-shredded and vacuum dried LIB material. The Impact Reactor delaminates the electrode foils and recovers > 98% of the included black mass directly in

the first step of the mechanical treatment. Impurities of Copper and Aluminium < 2%.

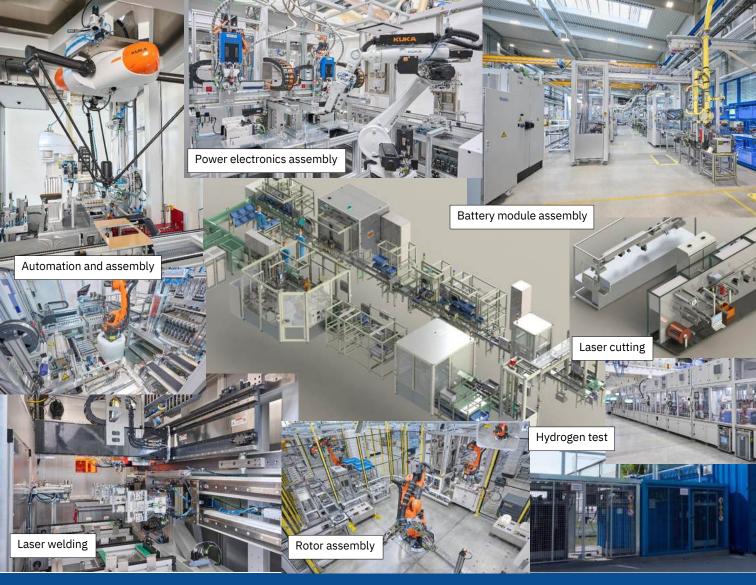
Strengths

Black mass recovery > 98% directly at the beginning of the mechanical treatment on one central point. Industrial solutions show, that the Copper and Aluminum impurities in the black mass are far smaller than 2% (re-use quality). Very clean and efficient downstream sorting with purest output fractions. Complete system is capsuled and operated as a dry process. Our system is already fulfilling respectively exceeding all future recycling quotes and emission requirements. Our products and solutions are based on operational knowledge from the battery recycling (our CEO and our Process Technician have operated a battery recycling line for more than 15 years). A lot of cooperations with universities and known players on the OEM and chemical side for future development and optimization.

Target clients

OEMs, recyclers, technology providers, hydrometallurgical operators etc. In the US we would like to meet companies connected to battery recycling or with the intention to enter the battery recycling business.





Planning, assembly and service of special machines

Sonplas GmbH





Sachsenring 57, 94315 Straubing, Germany

+49 9421 92750



info@sonplas.de



www.sonplas.de



Special machine manufacturer active in the automotive, battery, hydrogen and special assembly and testing sectors.

Products and Technologies

- Products: Battery module and pack: assembly and testing of battery modules and packs; Battery cell assembly: laser cutting of electrode material (highest quality cut edges at competitive speeds); E-mobility: power electronics assembly and end-of-line test (HV filters, chargers, BMS, 48V inverters, HV inverters 400V 800V); Automation and assembly: assembly of electronic and mechatronic parts (e.g. car keys).
- Technology deep process know-how in the following areas: Laser welding (steel, copper, aluminum, plastic); Laser cutting (any roll material); General assembly processes (dispensing, screwing, welding); Electrical testing laboratory and process know-how.

Strengths

High quality special machinery, customer service and partner located in the US, large portfolio and process know-how in the battery and other sectors.

Target clients

Automotive tier 1 and OEM. In general: Battery cell manufacturers or module producers, e.g. Solid Power, Saft, Amprius, Envision, Tesla, Rivian, American battery factory, ONE, ...



www.gtai.de/mep