

# R&D AT OTTOJUNKER



## Selected current projects:

- Heat storage with reversion into electricity
- Aluminium recycling
- Battery recycling



ADDED VALUE BY DEVELOPING SUSTAINABLE SOLUTIONS

WE UNDERSTAND METALS



# R&D

## at OTTOJUNKER

**Endusers and regulatory conditions require sustainably manufactured products. This new requirement, however, also offers new options for system suppliers.**

Together with our customers, partners and in close cooperation with universities and polytechnics, we develop sustainable solutions for our core products, i.e. heat treatment equipment and melting furnaces.

We focus on the electrification by resistance heating and induction heating while at the same time using our technology and practical experience for developing new products.

In the future, we shall exclusively focus on regenerative energies, recycling and raising the efficiency of our equipment.

For this purpose, OTTOJUNKER invest in the expansion of theoretical and applied R&D. Our R&D core team consists of 15 engineers in mechanical and electrical engineering and metallurgy. Agile management methods give us the necessary flexibility within the development projects.

Analytical and numerical methods form the basis of our developments. Testing at laboratory and pilot scale is then carried out at our technology center in Germany.



*OTTO JUNKER GmbH Technology Center at our Lammersdorf HQ close to Aachen.*



multiTESS, Brainergy Park Jülich

# Heat storage with reconversion into electricity

Since 2017, the Solar Institute Jülich has been developing the multiTESS storage concept (multi-functional thermal power storage) for a decentralized and flexible power and heat supply. Contrary to the conventional power-to-heat approach, heat is stored in the multiTESS thermal heat storage device at temperatures of up to 1,100 °C and can thus be reconverted into electricity in a thermal power process.

Under the TESS 2.0 project, the Power-to-Heat-to-Power usage chain of the multiTESS concept is realized by means of a pilot plant for the very first time.

OTTOJUNKER have developed the so-called Power to Heat (PtH) unit. The equipment heats up air from 300 °C to 1,100 °C and thus serves for charging the high temperature storage device.

During the trials, the operational behavior of the individual components was investigated, and the process management within the overall system was tested. With the results, a dynamic and thus responsive system could be developed.

That way, these systems can respond very quickly to low prices in the power market. In the next development step, a PtH unit for 1,200 °C will be developed.



Heating section for heating air from 300 °C to 1,100 °C.



Heat storage device in front of the TESS 2.0 building in which the OTTOJUNKER Power-to-Heat system is integrated.

## Sustainable aluminium recycling

using a combination of tilt rotary furnace and coreless induction furnace.



The R&D team has completed test campaigns on a new rotary tilt furnace for used beverage cans (UBC) and other recycling material.

In combination with a medium-frequency coreless induction furnace which also forms part of the test setup, a recycling route with an extremely low CO<sub>2</sub> footprint was developed.



# Recycling of end-of-life batteries

## Another development step for electromobility

**The necessity of recovering raw material from end-of-life batteries results in a rapidly growing market for systems engineering.**

In order to meet this situation, **OTTOJUNKER**, in cooperation with science and partners, develop an innovative recycling process for batteries from electromobility.

In a new, scalable furnace type, the batteries are first thermally treated and thus safely deactivated. That way, subsequent recycling and treatment processes can be made easier. The focus of the investigation is on the precious metal recovery by means of thermal and hydrometallurgical process technology. This improves the recycling ratio.



*Pilot plant for the thermal recycling of batteries*

## Together for a sustainable future

The **OTTOJUNKER** R&D team is looking forward to new cooperations, contacts and an exchange of ideas with you.

**Your contact at OTTOJUNKER R&D**

**Dr. Tobias Mertens**  
Research & Development

Phone: +49 2473 601 167  
Email: [Tobias.Mertens@otto-junker.com](mailto:Tobias.Mertens@otto-junker.com)

### **OTTO JUNKER GmbH**

Jagerhausstr. 22  
52152 Simmerath  
Germany

Phone: +49 2473 601-0  
Email: [sales@otto-junker.com](mailto:sales@otto-junker.com)  
[www.otto-junker.com](http://www.otto-junker.com)

