

# THERMOPROCESSING PLANTS AND EQUIPMENT



**... FOR COPPER EXTRUSION PLANTS**

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UNDERSTAND  
METALS**

# Otto Junker GmbH

Established in 1924, **OTTO JUNKER GmbH** draws on more than 90 years of experience and continuous product development. The company is represented by subsidiaries, service agencies and sales offices all over the world.

The product range embraces melting, casting, heating and heat treating equipment for the aluminium and copper industries as well as melting and casting equipment for iron and steel foundries. Beyond that, the in-house special-steel foundry in Lammersdorf produces finish-machined castings ready for installation.

Since 1982, the company has been owned by the OTTO JUNKER FOUNDATION. Consistent with the Foundation's charter, it promotes the training of young engineers at the RWTH Aachen University and sponsors research and development in the fields of metallurgy and electrical engineering.

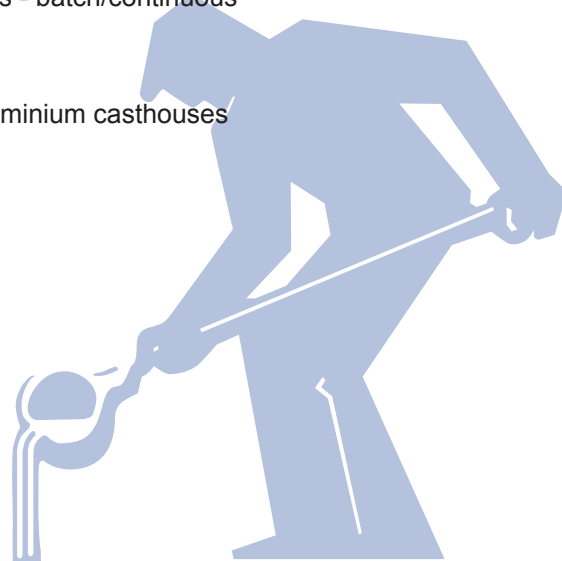
Application engineering is also in the focus of the Group's R&D.

The **“thermoprocessing“ business unit** designs, manufactures and installs equipment for customers in the aluminium and copper industries, mainly for:

- Rolling mills (slab, plate, sheet, strip, foil manufacturers)
- Extrusion plants (billet, rod, tube, profile manufacturers)
- Casting shops
- Forging plants
- Aluminium casthouses

In these industries the following OTTO JUNKER products are mainly used:

- Preheat and homogenizing furnaces - batch/continuous
- Annealing, heat treatment and ageing furnaces - batch/continuous
- Degreasing, annealing and pickling lines
- Hot dip tinning lines
- Gas-fired melting and pouring furnaces for aluminium casthouses



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# Tailor-Made Innovations

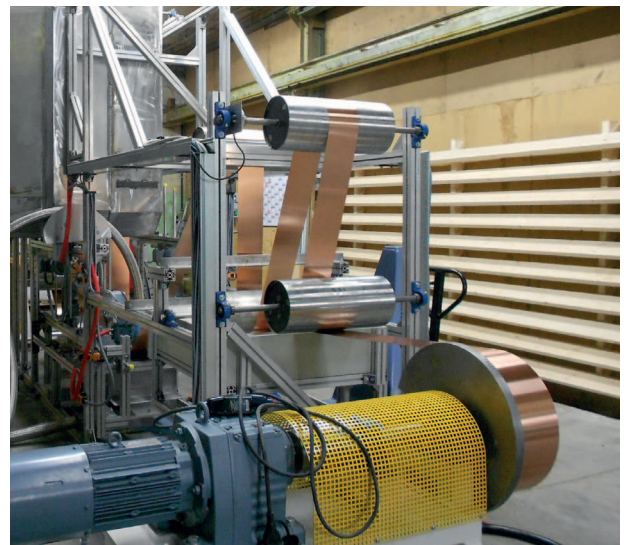
The guiding principle of our company's founder, Dr.-Ing. E. h. Otto Junker, applies more than ever today:

*“Identifying all problems without bias,  
finding the solution through joint scientific and practical enterprise,  
and supplying the result to the customer  
in the form of quality products.”*

Achieving this goal necessarily involves a number of success factors:

First and foremost among these is our workforce – about 450 skilled, experienced and highly motivated employees, plus about 25 technical and commercial apprentices every year, who excel at their diverse duties and share a commitment to the guiding principle established by the company's founder.

Product and equipment requirements are identified side by side with the customer, always with a view to attaining the desired final product quality. Our Lammersdorf research and development center is equipped with several pilot furnaces designed and dimensioned to conduct practical trials offering realistic results. This makes it possible to determine heat-up times and practical time-temperature charts in advance even for intricate materials or undefined product conditions (multiple stacking of different materials).





# Roller Hearth Furnaces

OTTO JUNKER is the leading supplier of continuous roller hearth annealing furnace lines for the heat treatment of copper and copper based alloys under protective atmosphere. Many of the world's major and well-known manufacturers are customers of OTTO JUNKER.

OTTO JUNKER roller hearth furnaces operate on the proven principle of high-convection.

## The high-convection principle provides the following advantages:

- No high temperature head is required (just a few Kelvin above product temperature)
- Zero risk of overheating
- Uniform heat transfer to the charge
- Identical mechanical and physical properties

OTTO JUNKER offer two different types of roller hearth furnaces:

- Jet-heating systems
- Mass-flow systems

The **Jet-heating** furnace type is characterized by an extremely high air velocity which makes for an even more intense heat transfer. It is therefore particularly suitable for the heat treatment of thin or single-layer material. This technique requires no high temperature heads to provide good heating. The uniform furnace chamber temperature ensures a highly even temperature distribution throughout the charge.





**Mass-Flow** furnaces rely on a “soft” high-convection process and are particularly well suited for multi-layer products (LWC coils and material to be annealed in bundled form). The proven space-saving configuration is the stack furnace in which multiple loads are annealed while stacked one above the other. The main characteristics of a mass-flow furnace, apart from its high atmosphere circulation rate and the resulting intense heat transfer, are the defined flow pattern and a uniform furnace chamber temperature which exceeds the material temperature by just a few Kelvin. In addition, stack furnaces are noted for their short build and ease of access.

### Design options

- Direct or indirect heating
- Indexing or continuous operation
- Open or protective atmosphere (typically N<sub>2</sub> or up to 100 % H<sub>2</sub>)
- Optional vacuum chamber
- Gas fired or electrically heated





## CTP (Copper Tube Purging System)

Most mass-flow furnaces supplied by OTTO JUNKER are equipped with our **Copper Tube Purging System (CTP)**. This OTTO JUNKER tube purging technology ensures clean, high-quality copper tubes by flushing out the oil vapours that will typically form inside tubular material during the heating process. As a result, carbon deposits on the interior surfaces of the tube will be reduced significantly.

Studies have shown that with an OTTO JUNKER tube purging system, much less carbon and oil residue will usually remain present on interior tube surfaces when compared to a system without protective gas purging. Even the very exacting requirements placed on copper tubes for air conditioning equipment can thus be fulfilled.



### Automatic handling systems provide the following advantages:

- Available for each furnace version
- Fewer manual interventions, reducing the risk of damaging the coils
- Complete integration into existing equipment is possible
- Full integration into the process technology is supported as well
- Automation can be introduced gradually
- Entirely unattended operation - from coil production to packaging - is a realistic option







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