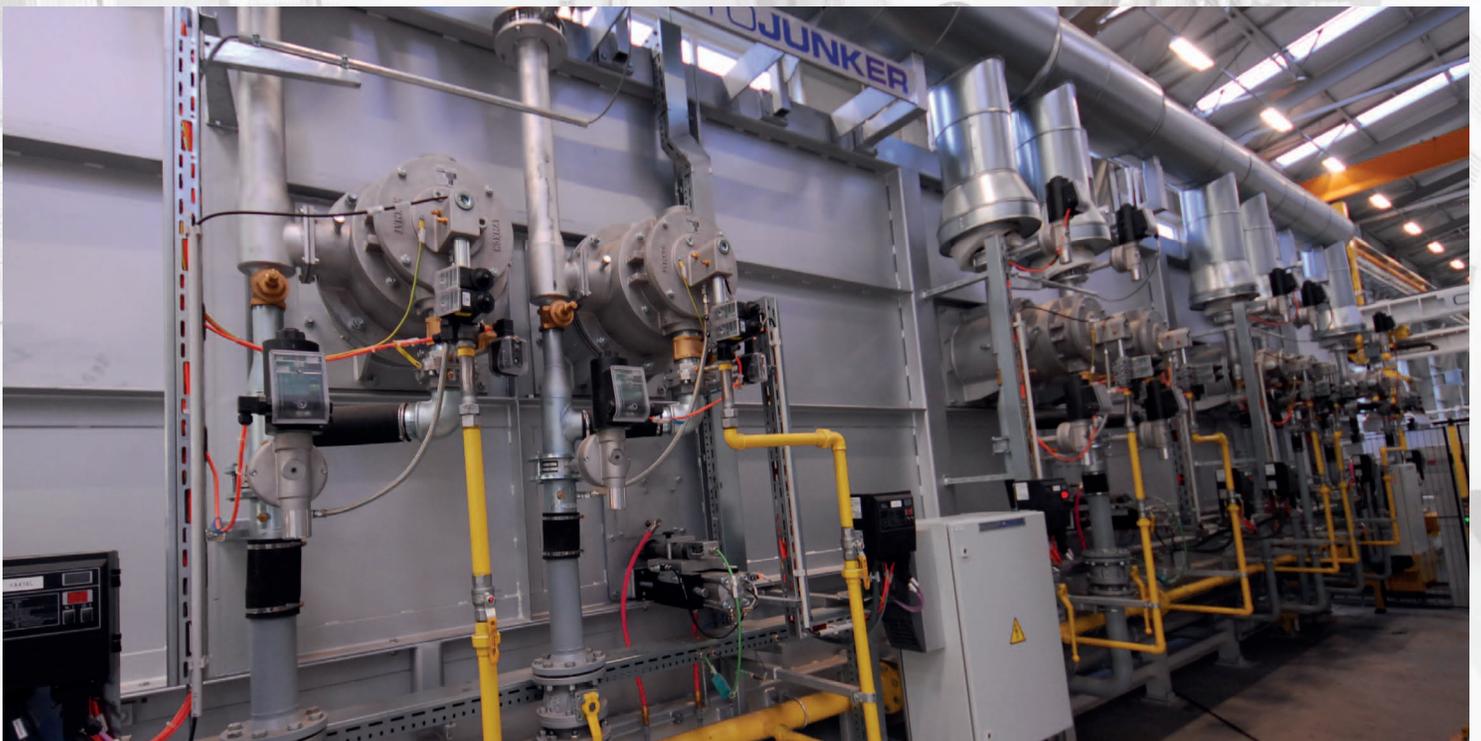
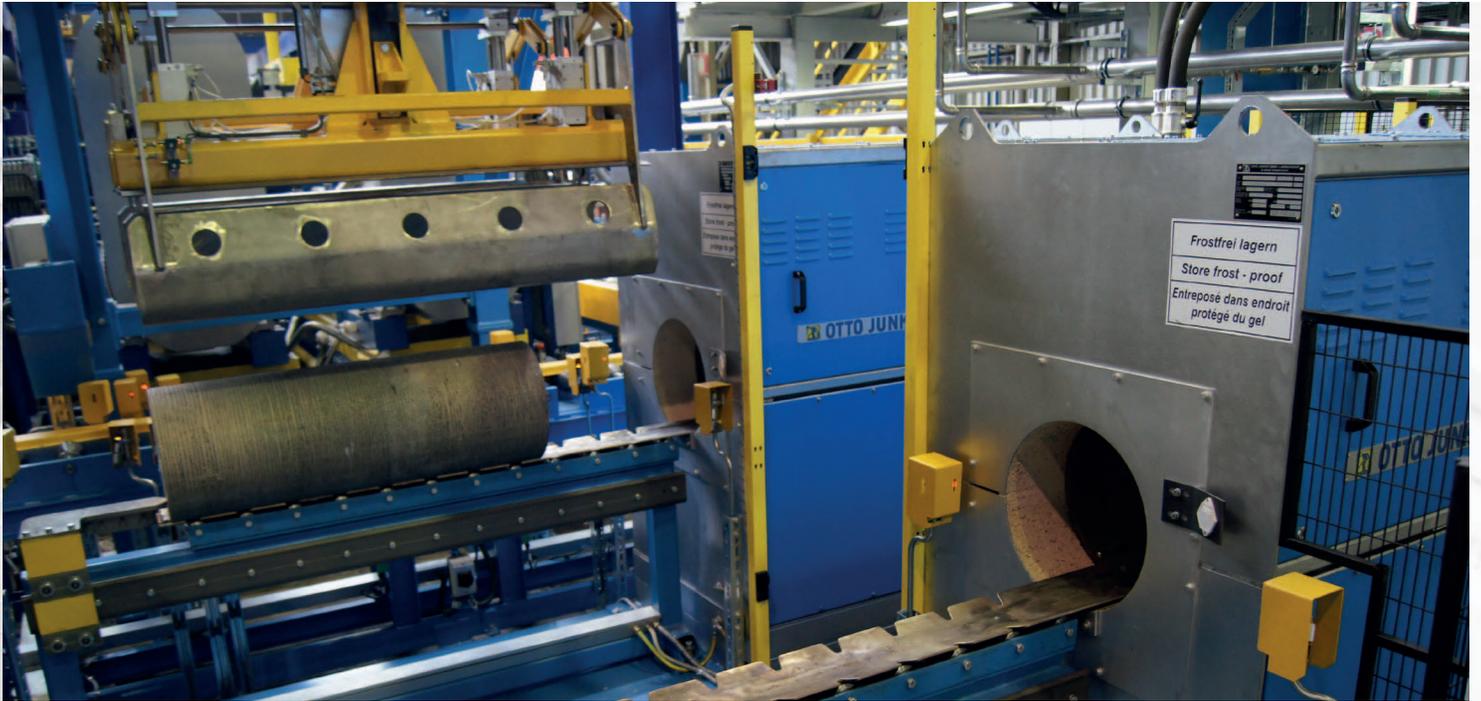


THERMOPROCESSING PLANTS AND EQUIPMENT



... FOR ALUMINIUM EXTRUSION PLANTS

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WE
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.

Our foundry in Lammersdorf produces high-grade sand castings from iron, nickel and cobalt-based materials, both as cast and fully finished. In the attached machining section, precision parts are made for demanding applications.

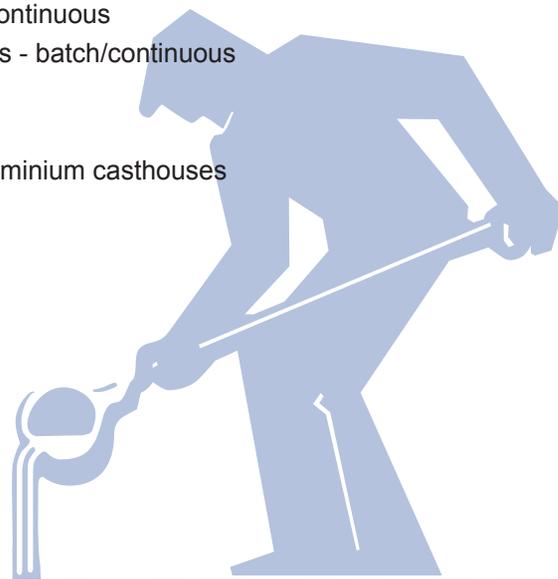
Since 1982, the company has been owned by the OTTO JUNKER FOUNDATION. Consistent with the Foundation's charter, it promotes the training of young engineers at the RWTH Aachen University and sponsors research and development in the fields of metallurgy and electrical engineering.

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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Convection Heater

Convection heater

The *modern* heater, notably where particularly close temperature tolerances or extremely low energy costs must be achieved. Gentle heating of billets is performed exclusively by means of a high-velocity fluid flow directed onto the metal from special nozzle systems ("jet heating"). Unlike a gas fired heater where the flame temperature will always far exceed the temperature of the billet, a convection heater requires only small temperature differences. It can thus attain particularly close temperature tolerances reproducibly to meet special application requirements. The use of highly efficient recuperative burners ensures an efficiency that is second to none. Different conveyor systems are available to match various production requirements in the most cost-efficient manner.

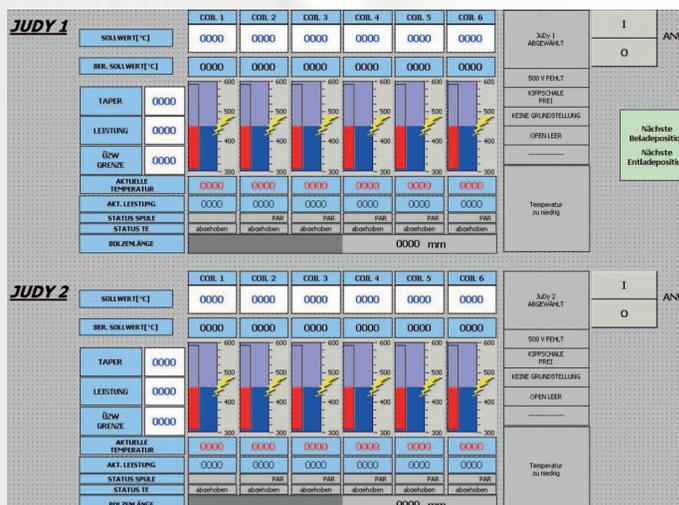


JunkerDynamicHeater[®] - MC

JunkerDynamicHeater[®] - MC

The *flexible* type of heater is the induction heater. Operating in “lot size 1” mode, it allows the operator to set any desired temperature profile – the so-called “taper” – over the length of the billet for an isothermal extrusion process. As the induction heater heats every billet individually, billet-to-billet temperature or length variations (in conjunction with a cold saw) can be implemented without impairing the particularly close temperature tolerance. Apart from the custom-designed induction coil, OTTO JUNKER’s IGBT frequency converter – built into hundreds of installations and providing numerous parameter variation options (power, frequency) – is at the core of this technology. The system can be supplied with optional equipment such as transformers or water recooling systems.

Where particularly high flexibility standards apply, induction heaters are preferably employed as a “standalone” solution. If the main process objective is to obtain a reproducible taper rather than to maximize flexibility, the induction heater can be used both in parallel and in line with an upstream gas fired heater.



Further unique selling points of the **JunkerDynamicHeater®** include the following:

- Ceramic melt protection tube reduces energy demand.
- OTTO JUNKER billet trough conveyor system prevents scratches and scoring on the billet surface and eliminates aluminium build-up in the coil.
- The “blind heating sequence” increases the thermocouple maintenance interval by a factor of 2.
- IGBT converter and coil, as core components, are built in-house and tested/adjusted before shipment.



JunkerDynamicHeater[®] - SC

JunkerDynamicHeater[®] - SC is the small-footprint, low-budget solution. This easily retrofittable version of an induction heater is used to boost the output of an existing gas fired heater or to provide a temperature profiling (“taper“) capability.

It is characterized by its particularly compact design, given that the so called JuDy - SC unit needs only one single short coil section. A special measuring and control process developed by OTTO JUNKER allows the temperature profile to be created dynamically during the passage of the billet.



HiPreQ[®] - quenching systems

In the case of special aluminium alloys, selective cooling of the metal may be required before and/or after the extrusion process in order to impart particular metallurgical properties to the material. Addressing this requirement, OTTO JUNKER has developed high-performance cooling systems for billets and extruded profiles which enable the user to apply reproducible, accurately controlled cooling rates. Given their precision control capabilities, our HiPreQ[®] systems far outperform conventional equipment.

HiPreQ[®] billet quench

- Metallurgical effects permit a substantial increase in extrusion speed and optimize the metal quality
- Separate control zones for an accurate temperature profile
- Cooling programs can be created and executed in a reproducible manner ("teach-in")
- Steplessly variable cooling output
- Closed water circuit for low operating cost and eco-friendly operation



Magazines

Magazines serve to store billets or logs for use in production. The choice of the appropriate magazine for a given application depends on a mix of factors. Today, it has become standard practice to provide tracking, recording and archiving of all production data. All OTTO JUNKER magazines therefore come with a material data management capability. The production data of incoming billets or logs are entered either manually or automatically by means of a bar code reader. This information ensures, e.g., that the program will adjust the setpoints (temperatures, lengths, etc.) as required for the relevant equipment (furnace, saw, etc.) throughout the process. Actual values are then added and the information for each billet is transmitted to the extrusion press in the form of a standardized data record.

Vertical magazine

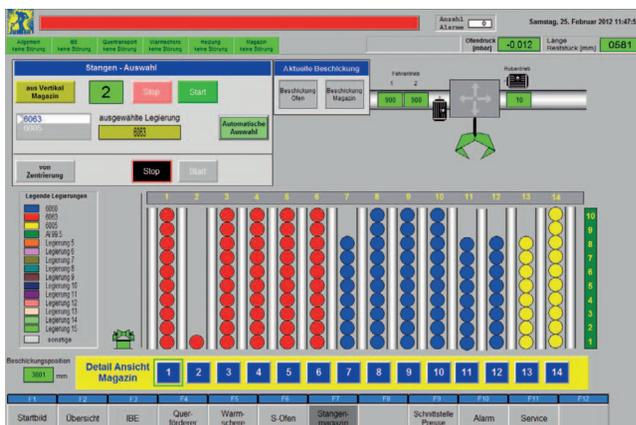
- space saving storage of logs
- alloy-sorting possible
- restocking after job changes possible

Chain magazine

- either upstream of the vertical magazine
- or for direct loading on the feeding device
- optimum log orientation is provided by individual drives

Pallet magazine

- loading by forklift or crane
- positioning for loading/unloading by means of a pallet changer
- unloading by head-on gripper



Handling equipment

Conveyor systems are needed to move billets and logs from the magazine to the extrusion press quickly, reliably and without surface damage. As conditions differ in every extrusion press facility, the logistics need to be adapted to the local situation. To this end, OTTO JUNKER offers a modular system providing diverse standardized functions.

V-trough handling system

- for crosswise travel
- supports any number of horizontal stop positions
- static or swing-type V-trough
- with single trough, dual trough or two individual troughs, depending on specified cycle times

Roller conveyors

- for lengthwise (forward/backward) travel

Gripper handling system

- for crosswise and lengthwise travel
- supports any number of horizontal and vertical stop positions
- circumferential or head-on gripping action
- with single gripper, dual gripper or two individual grippers, depending on specified cycle times
- static or swing-type grippers

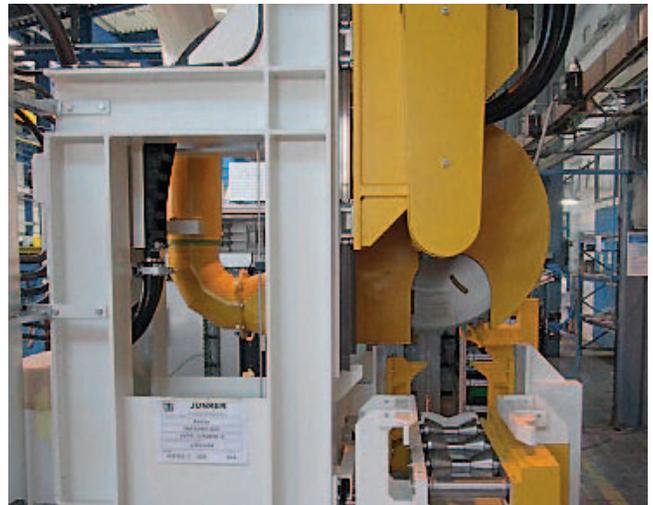


Cold saw, hot saw

If logs are used, these must be sawn or sheared accurately into billets meeting the requisite specifications of the extrusion press. This cut-to-length operation may be carried out in the cold or heated state. From a cost efficiency aspect the “park cut” system merits special attention. It largely avoids odd ends, if the use of split billets is permitted, regardless of whether cutting is performed with a cold saw, hot saw or hot shear. Moreover, all units come with an adjustable fixed stop and clamping systems to ensure exact billet lengths with minimum angle error.

Cold and hot saw

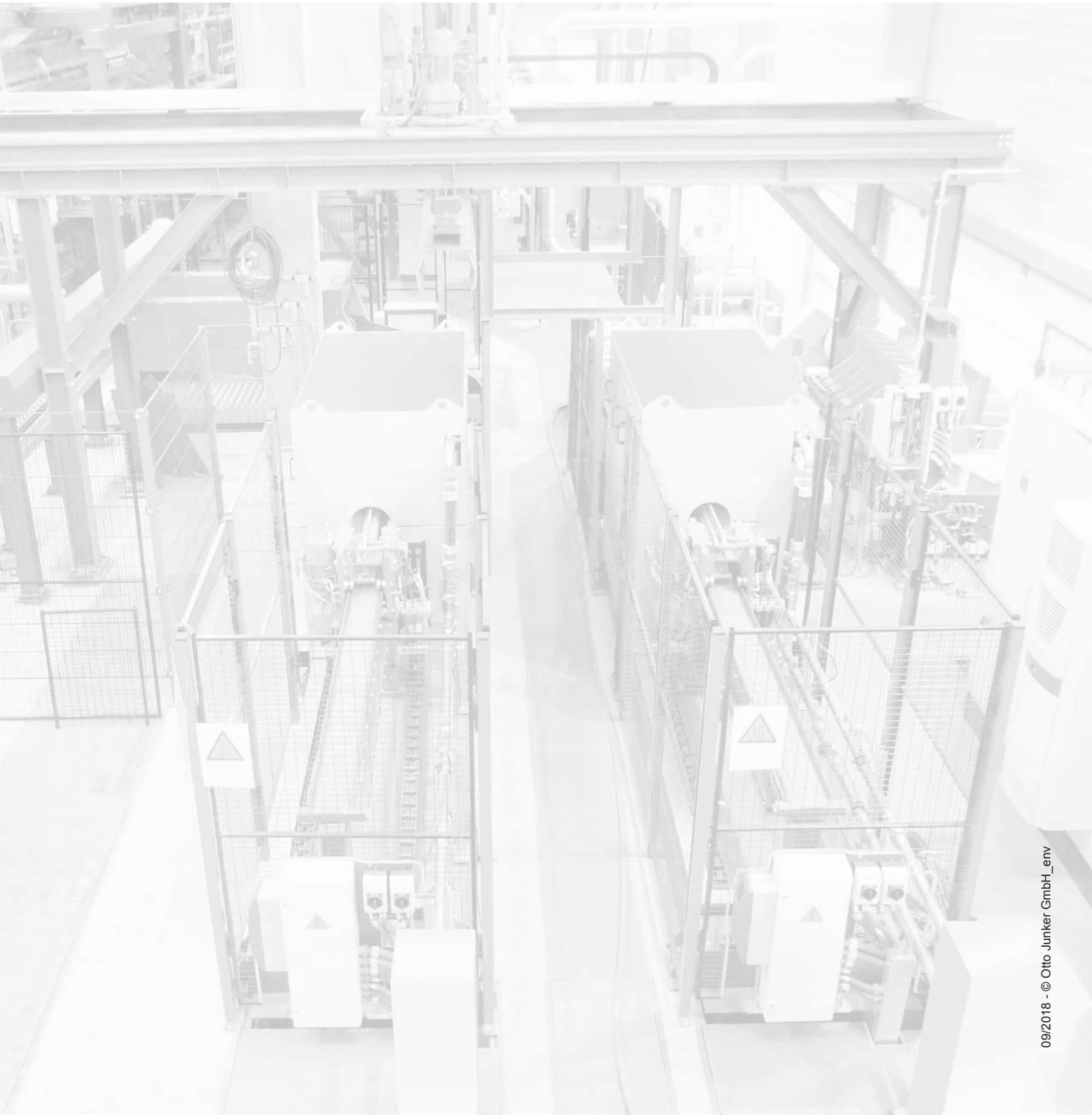
- Thin-gauge saw blades designed for high cutting speed and durability
- Sturdy design permits high-speed cutting
- Adjustable fixed stop for accurate length measurement
- Available with extraction and swarf briquetting system
- Hot saw is typically used after a gas fired heater
- Cold saw is typically used before an induction heater. This solution provides maximum flexibility.



Billet or log washer

For cleaning of billets or logs, OTTO JUNKER offers a high-pressure washing system. It uses a closed-loop water circuit with integral filter system to protect the environment while minimizing operating costs. The high-pressure washer features an air wiper to prevent any carryover of water into the downstream process.





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