



Customized
Heat Treatment Systems for
Aluminum

schwartz heat treatment systems – as unique as your production line



schwartz heat treatment systems tailored to your production needs

Ever since schwartz was founded in 1984, we have been developing heat treatment systems tailored to our customers' specific production requirements along with the associated handling equipment.

Our specialty heat treatment systems for aluminum applications are being successfully deployed primarily in the automotive industry (OEMs), its supplier segments (tiers 1 & 2), the aircraft industry and the construction industry. Our product portfolio comprises chamber furnaces, pit furnaces, continuous furnaces, elevator furnaces, roller-

hearth furnaces, and vertical furnace systems. Whatever your processing needs – rolled products, extrusions, forgings or castings – we will manufacture the right heat treatment solution for your company.

We custom-design, manufacture, and efficiently integrate all our systems into production lines the world over. From the earliest enquiry phase we take into account your specific production conditions in providing sound and competent advice. What's more, the deployment of all our proven modules is consistently aligned to your specific requirements.



Innovation based on vast experience

At our in-house Technology Center we operate a modern testing facility. This allows the key advantages of high convection technology to be determined for any part or sheet metal and demonstrated in practice to customers or prospective users.

To maintain our ability to fulfill our customers' high quality and innovativeness demands, we place special emphasis on regular further training for our staff. As a result, our experienced engineers and technicians are characterized by their state-of-the-art technological expertise.

At the same time, working with a customer in a partnering spirit is always our key priority. From the first enquiry through system development, delivery and commissioning to competent all-round after-sales support, we will serve as your competent and reliable partner anywhere in the world.

Your productive benefits: Heat treatment systems for aluminum made by schwartz



International standards

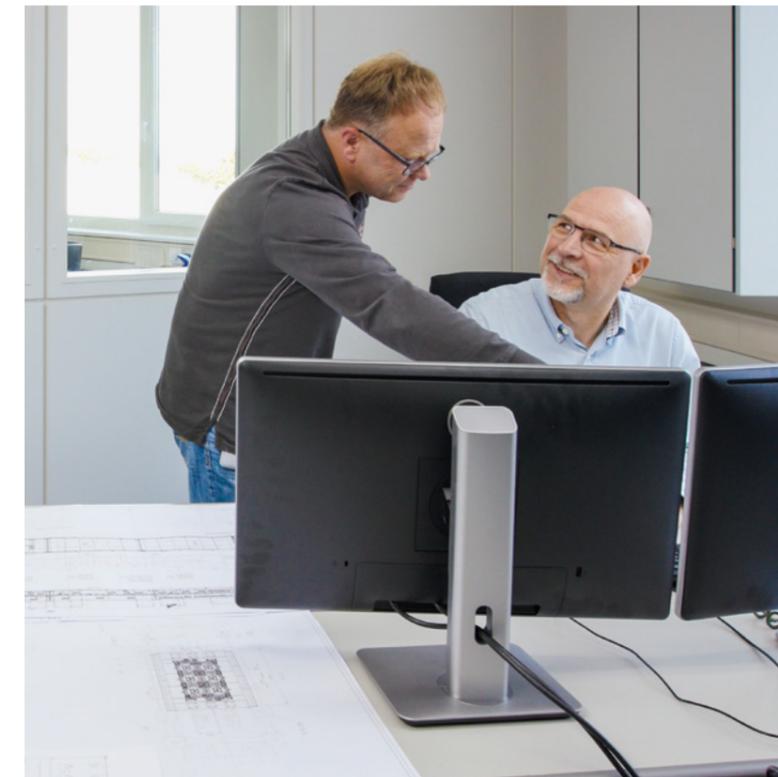
Automotive manufacturing today is characterized by a focus on vehicle lightweighting and on reducing energy consumption and CO₂ emissions. In line with this trend, the share of aluminum castings and forgings in cars nowadays is steadily increasing. Our heat treatment systems for aluminum address this development in that they conform to both SAE AMS 2750 and CQI-9 Heat Treat System Assessment specifications.



Factory Acceptance Test

All schwartz heat treatment systems are fully assembled and undergo thorough pre-shipment hot testing at our German manufacturing sites in Simmerath and Aachen or in Kunshan, China, for the Asia-Pacific region. We heat up the finished system under real-life operating conditions to check key parameters. Some initial fine-tuning is undertaken during the Factory Acceptance Test (FAT) to speed up installation at your site.

If required, you can join us in conducting this FAT so you can be certain your system is fully functional before it leaves our premises. Thanks to our highly professional trained staff the subsequent installation and commissioning at your production site will be carried out successfully anywhere in the world in the shortest possible time.



Worldwide service

Even after your system has been commissioned, our professional customer service team will always be at hand to provide any assistance you may need. Whether it's periodic maintenance, installation of spare parts, operator training or support with temperature uniformity (TUS) and system accuracy (SAT) monitoring, we will remain your reliable partner throughout the long lifecycle of your schwartz heat treatment system.

Jet heating – effective heat treatment for aluminum parts of diverse geometries



Our jet heating technology provides efficient heating via high-convection recirculated air, flue gas or protective atmosphere. The gases are uniformly applied at high velocity to the aluminum parts by an array of product-specific nozzles. The optimum nozzle-to-product distance ensures a maximum heat transfer coefficient that is many times higher than with conventional forced air circulation – and thus reduces the heat-up time accordingly.

The parts can be placed side by side across the overall furnace width. For parts of varying height and geometries a nozzle array with motorized adjustment can be used to set the ideal nozzle-to-product distance. Our conveyor systems, e.g. chain conveyors for billets or slat conveyors with V-shaped supports for discs and billets, are custom-designed to match your specific product range and part geometries.

Our jet heating systems can be designed for heating aluminum parts to forging temperature or for solution annealing with an appropriate soak zone. The throughput capacity of our furnace systems typically ranges from 500 to 5,000 kg/h.

Jet rotation heating – reliably uniform heating of aluminum coils



Jet rotation heating combines jet heating with a rotation of the nozzle bank. We specifically developed this patented system for the uniform heating of aluminum strip coils.

The tubular nozzle array uniformly heats up the coil in a protective atmosphere and the perpendicular jet impingement ensures optimum heat transfer. Automatic width adjustment of the tubular nozzle bank minimizes heat-up times even where coil widths vary. The high heat-transfer coefficient (approx. 4 times higher than with conventional heating methods) is achieved through the optimized coil-to-nozzle distance.

Rotary heat transfer to the coil surface prevents surface markings that would otherwise occur as a result of local heating of critical alloys, e.g. those of high magnesium content.

Our product range offers you a wide choice ranging from a single-coil furnace to chamber furnaces accommodating five coils in a row.

For uniform product cooling the jet heating system is equipped with a protective-gas-to-water heat exchanger. In the furnace thin strip coils are supported on their spools, while heavier-gauge strip coils are held on V-supports or troughs. The coils are loaded into the furnace by a traversing charging machine with lifting arms.



Scan the QR code to see the film about our heat treatment systems for aluminum.

Batch-type and roller-hearth furnaces for highly efficient heat treatment of aluminum tubes, rods and sections



schwartz chamber furnaces can heat aluminum products of any geometry – anything from bulk parts in transport containers, ingots or billets to aluminum components arranged on trays.

Powerful recirculation of fan-driven hot air or flue gas ensures dependably uniform heat transfer. The atmosphere flow is controlled individually to match the product arrangement in the furnace or on the trays. Chamber furnaces are loaded by means of a bogie or by placing the loads on trays.

In our roller-hearth furnace for solution annealing applications the aluminum rods and profiles are fed side by side into the heating chamber on rollers. Heat treatment is carried out by high convection with the product resting on an oscillating roller track. Upon completion of the annealing process the product is immediately fed into the high-pressure and low-pressure water quench and then dried.

In the heat treatment of rods and profiles, this furnace design has proven its merits many times over, delivering excellent straightness of the quenched product.

Elevator furnace – the space-saving alternative to a chamber furnace



schwartz elevator furnaces are a space-saving alternative to chamber furnaces. The loads of thin-walled aluminum sheet metal or castings are lifted into the furnace by an integrated lifting device and then locked in place. Once the furnace bottom is closed, the mostly electric-powered heat treatment process begins. Upon completion of the heat treatment cycle, a quench tank mounted on a mobile floor carriage can be moved under the furnace, allowing the aluminum load to be quenched in 7–13 seconds depending on product type. This tank is equipped with recirculating pump plus cooling and process heating equipment.

This elevator furnace design also supports T6 heat treatment, which combines solution annealing with subsequent quenching and artificial ageing of the product.

Pusher furnaces – a compact footprint even in artificial ageing of forgings



In addition to continuous conveyor furnaces, we also offer indexing pusher furnaces for artificial ageing of forgings. These systems additionally ensure fast and uniform heating, a quick return of parts into the processing workflow and, above all, require substantially less space.

In a pusher furnace the product is placed in racks and heated by a high-intensity recirculating airflow. Hydraulic pushers advance the racks through the heating chamber on skid rails in line with the pushing cycle set. The loaded racks are fed into the furnace and discharged at the exit end by motor-operated chain transmission elevators. More space can be saved by placing the air-cooling zone underneath the furnace chamber.

Selected references



BHARAT FORGE



A growing number of renowned customers all over the world trust our product quality and high standards. As your dependable partner for innovative heat treatment systems

for aluminum, you can count on us to develop a made-to-measure system to suit your operational needs, and to offer a service that is precisely tailored to your requirements.



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