schwartz
Wilden Industries

Customized Heat Treatment Systems for Aluminum

schwartz heat treatment systems – as unique as your production line

schwartz heat treatment systems tailored to suit your production

Since our company's foundation in 1984, we have been developing custom heat treatment systems and associated handling equipment for our customers, tailored to satisfy specific production requirements.

Our specialty heat treatment systems for aluminum applications have been defining success primarily in automotive manufacturing (OEMs), its supplier segments (tier 1 and tier 2), in the aircraft industry as well as in the construction industry. Our product portfolio comprises chamber furnaces, pit furnaces, continuous furnaces, elevator furnaces, roller-hearth furnaces, and vertical furnace systems. Whether your need to process forgings, castings or metal sheets – we will build the right heat treatment solution for your company.

All schwartz systems are designed, completely manufactured, and efficiently integrated by us into your production lines worldwide. We provide professional and expert advice, taking account of the conditions in your operation from an early stage. The selection of our proven modules is also strictly based on your specific requirements.

Innovation based on vast experience

At our in-house technology center, we run a modern testing and trial facility. This allows the important advantages of high convection technology to be determined for any part or sheet metal and can be demonstrated in practice to customers or prospective users.

To safeguard our ability to permanently fulfill the high demands on the quality and innovative strength of schwartz, we place special emphasis on continuing staff education and training. Our experienced engineers and technicians bring leading-edge knowledge and skills to their task.

Cooperation with the customer in a spirit of partnership is our priority goal. From the first inquiry through system delivery and commissioning to all-round after-sales support, we stand by your side with know-how and reliability, anywhere in the world.

Your production benefit: Heat treatment systems for aluminum ‘made by schwartz’

International standards

Modern automotive engineering is marked by a focus on vehicle lightweighting, as well as on cutting energy consumption and CO_2 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 addresses this development, conforming to both SAE AMS 2750 and CQI-9 Heat Treat System Assessment specifications.

Factory Acceptance Test

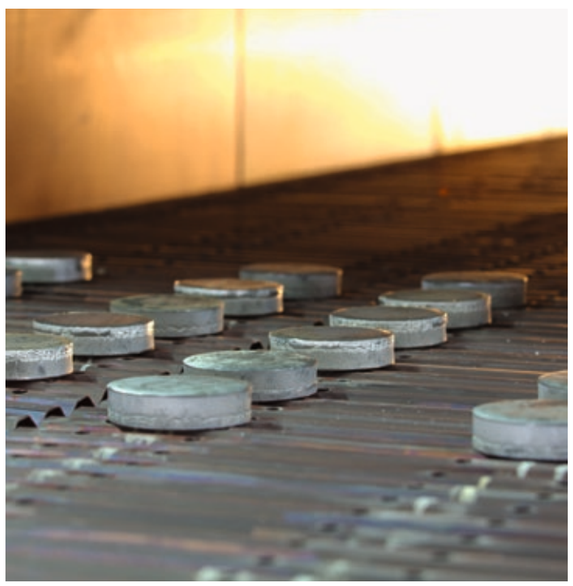
Upon completion and prior to delivery, each system is subjected to a function test. We thus ensure that all components work perfectly and you obtain a fully functional, high-quality installation.

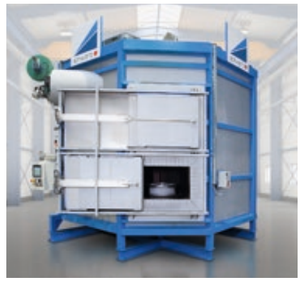
At your request, the FAT will be conducted jointly with you so that you can convince yourself of your system's full functionality before it leaves our premises. Subsequent installation and commissioning at your production site will be carried out successfully in minimum time, anywhere in the world, thanks to our highly trained professional staff.

Worldwide service

Even after your system has been commissioned, our professional customer service team will continue to provide support. Whether it's about 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 installation.

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



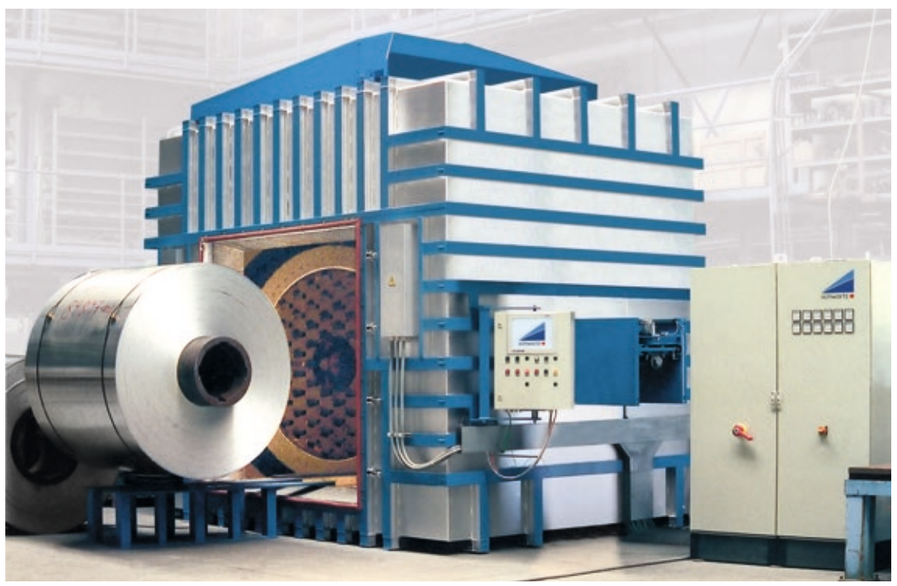


Our jet heating principle provides efficient heating via high-convection by recirculation air, flue gas or protective atmosphere. The gases are uniformly applied to the aluminum parts at high velocity by an array of nozzles adapted to the product. Due to the optimum nozzle-to-product distance, a maximum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

The parts can be placed side by side across the complete furnace width. For varying in height and geometry, a nozzle array with motorized adjustment can be used to set the ideal nozzle-to-product distance. Our conveyor systems, including e.g., chain conveyors for billets or slat conveyors 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 banks. This patented system has been developed by us specifically for perfectly uniform heating of aluminum strip coils.

The tubular nozzle arrays heat up the coil under protective atmosphere uniformly and with an optimum heat transfer to the sides of the coil thanks to perpendicular jet impingement. Automatic width adjustment of the tubular nozzle banks minimizes heat-up times even where coil widths vary. The high heat transfer coefficient (4 times higher than with conventional heating methods) is due to the optimized coil-to-nozzle distance.

The rotation of the nozzle banks during heating prevents surface markings which would otherwise result from localized heating of certain alloys, e.g., those of high magnesium content.

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

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

Heat treatment of forged aluminum parts for your fully automated production line

We offer complete aluminum forging solutions for your automated production line.

In addition to fast and homogeneous heating, our automated production lines also produce the required short cycle times of only 5 to 10 seconds. Loading and unloading operations are performed by robots with grippers adapted to your products and exit-end lifter systems with roller conveyors.

Robots also transfer the parts into the water quenching bath. Depending on your requirements, the subsequent aging process can be carried out either in our chamber furnaces or in our continuous or pusher-type furnaces.

We supply you with individual heat treatment systems for heating, solution heat treating with water quenching, as well as artificial aging of aluminum forged parts or sheets, complete with loading and unloading systems, on completion of our in-house acceptance test. In this way, we shorten the commissioning time at your site.

Semi-hot and hot forming of aluminum sheets

For semi-hot and hot forming of aluminum sheets, we offer you our patented application with high convection Jet Heating that has been successfully tested in our in-house Technology Center many times.

This innovative furnace system can be used together with our radiation-heated furnace for steel sheets upstream of a press as a twin or duplex system to treat either aluminum or steel.

The unloading roller track with centering and lifting system can be used for both furnaces.

Pusher furnaces – save space, also in artificial aging of forgings

Apart from continuous conveyor furnaces, we also offer indexing pusher furnaces for artificial aging of forgings. These systems likewise provide fast and uniform heating, a quick return of parts into the processing workflow and, above all, substantially reduced space requirements.

In a pusher furnace, the product is placed on trays and heated by a high-intensity recirculating airflow. Hydraulic pushers advance the racks through the heating chamber on skid rails according to the set pushing cycle. The loaded racks are fed into the furnace and discharged at the exit end by motor-operated elevators with chain transmission. Further space savings are achieved by placing the air-cooling zone underneath the furnace chamber.

Chamber and roller-hearth furnaces – highly efficient heat treatment of aluminum tubes, rods, and sections

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

Powerful recirculation of hot air or flue gas driven by fans ensures a 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, the aluminum rods and profiles are fed into the heating chamber appropriately spaced side by side on rollers. The 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 attached high-pressure and low-pressure water quench, and finally, dried.

This furnace design has proven its merits many times over in the heat treatment of rods and profiles. It provides excellent results in terms of straightness of the quenched product.

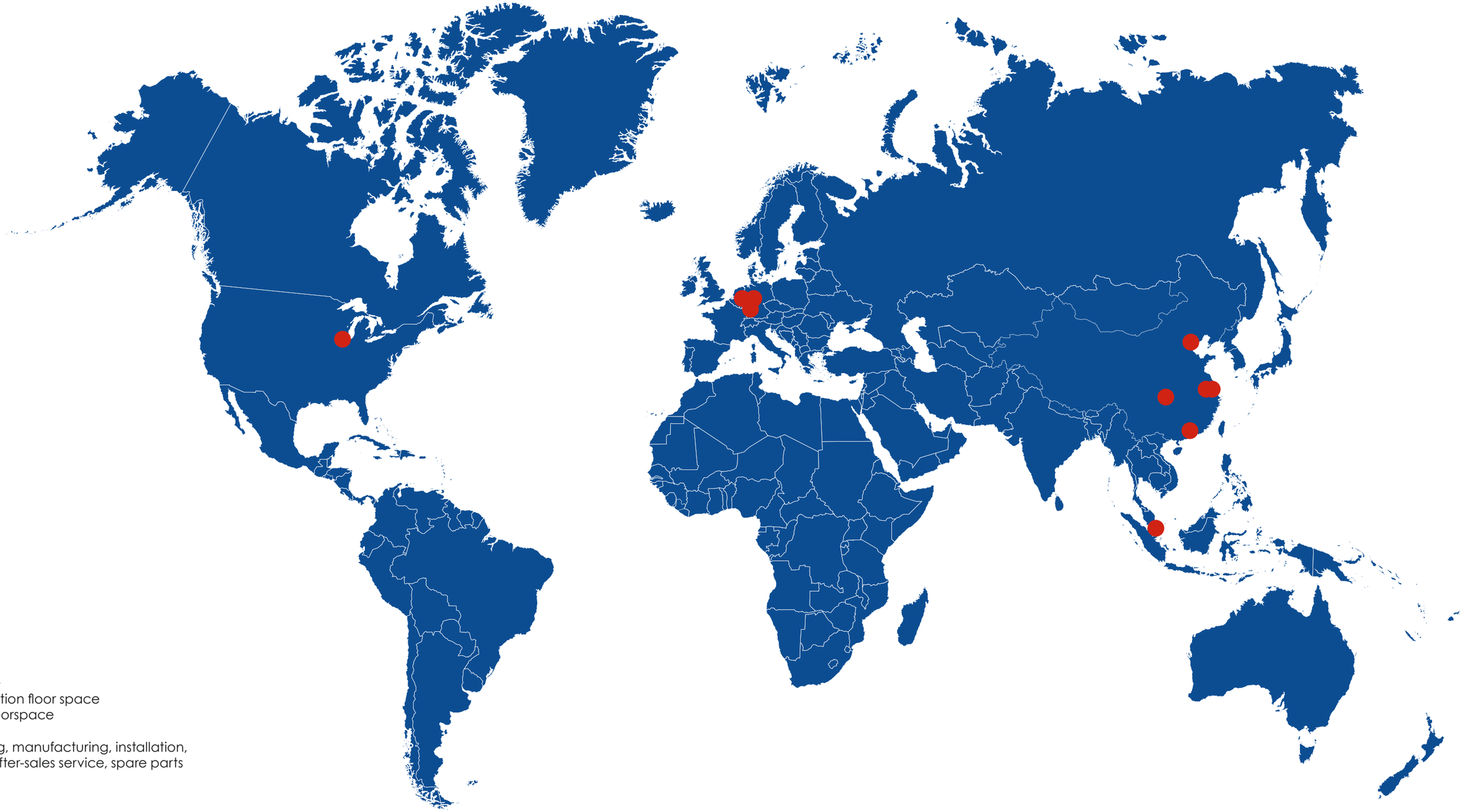
Elevator furnace – space-saving alternative to a chamber furnace

The schwartz elevator furnaces are a space-saving alternative to chamber furnaces. The batches of aluminum parts such as thin-gauge aluminum sheets or castings are raised into the furnace by an integrated lifting device and then locked in place. Once the furnace bottom is closed, the heat treatment is started, in the majority of cases with electrical heating. 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 the product type. This tank is equipped with recirculating pump plus cooling and process heating equipment.

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

A growing number of renowned customers worldwide place their trust in our product quality and exacting standards. You too can count on us as a dependable partner in the field of innovative heat treatment systems for aluminum. We will develop a made-to-measure system for your operation – and offer a service that is precisely tailored to your requirements.

The schwartz group – present worldwide, always nearby: personal, capable and reachable at all times



- 10 sites worldwide
- 20,500 m² production floor space
- 2,000 m² office floorspace
- 250+ employees
- Sales, engineering, manufacturing, installation, commissioning, after-sales service, spare parts

Photos by: schwartz GmbH, Melanie Conrad-Franzen and Fotolia

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