ONEJOON

HEAT TREATMENT OF ALUMINUM WHEELS

IN-DEPTH PROCESS EXPERTISE BASED ON EXTENSIVE EXPERIENCE
OF PLANT DESIGN AND IMPLEMENTATION.

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HEAT TREATMENT PLANTS

Improving the fuel and resource efficiency of road vehicles can help to drive down global carbon emissions. One approach is to reduce weight by incorporating automotive components made from lighter materials.

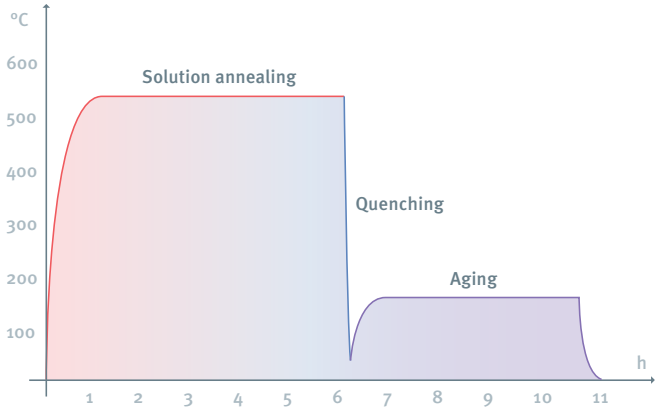
Lightweight construction entails the use of high-strength steels, plastics, aluminum sheet, composites, and aluminum castings, die-castings and forgings. Components subject to high stress, such as chassis, body and engine parts, as well as wheels, are, for example, manufactured from aluminum alloys.

Aluminum components must undergo heat treatment to improve their mechanical properties. There are generally three process stages: solution annealing, quenching, and aging.

The name ONEJOON has been synonymous with end-to-end solutions, outstanding quality, and maximum reliability in the heat treatment of lightweight components for the automotive industry.

Features of ONEJOON heat treatment plants

- Precise temperature control
- Outstanding uptime
- Low operating costs
- Extremely high environmental and safety standards



PROCESS STAGES

Solution annealing
Solution annealing takes place just below the melting point of the aluminum alloy. At a high temperature and a correspondingly high diffusion rate, the alloying elements are uniformly dispersed throughout the aluminum solid solution.

Quenching
Quenching (rapidly cooling) the supersaturated solid solution 'freezes in' the homogeneity obtained by solution treatment and prevents the dissolved alloying elements from precipitating out.

Selection of the quenchant depends on the component's properties and sensitivity to distortion, and on the required quenching rate. The following can be employed:

- Water
- Aqueous polymer
- Air

Aging
During aging, precipitation processes in the supersaturated solid solution impart the necessary hardness to the material. This stage concludes the heat treatment process.

A cooling zone can be integrated downstream of aging to cool the components in preparation for further production processes.

A wide range of factors must be taken into account in planning and implementing tailored heat-treatment plants. Design, project implementation, and sales professionals from ONEJOON work closely with the customer to develop the ideal solution.

Key factors determining plant design

- Throughput
- Component geometries
- Space available at the designated installation site, and room height
- Process requirements

ROLLER PLANTS – AUTOMATIC OPERATION FOR EFFICIENT WHEEL PRODUCTION

Roller plants are among ONEJOON's most long-established offerings. They are the system of choice for many production scenarios, and more than 70 have been installed to date.

Aluminum wheels are transported through the multilevel plants on roller conveyors. All conveyor drives and bearings can be easily accessed from the exterior of ovens and furnaces. Baskets are not required to carry the wheels.

The standard ONEJOON plant layout has a small footprint: the aging oven and the solution annealing furnace are vertically stacked, with the quench tank directly below the output end of the annealing furnace.

When a plant is populated with wheels of multiple sizes, wheel-size detection at the input end ensures a suitable loading pattern with a varying number of wheels per row.

Lifting and loading device for a solution annealing furnace.

Key benefits of a roller plant

- No baskets required to convey wheels
- Internal heat recovery from the exhaust air of the solution annealing furnace
- Small footprint with stacked furnaces
- Various plant layouts possible

Configuration of ovens and furnaces in line with available space

- Stacked
- Adjacent
- In line

Quenchants

- Water
- Aqueous polymer

Optional plant components

- Gas-fired or electric ovens and furnaces
- Cooling zone downstream of aging oven
- Rinsing device for polymer quenching

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