

COMPETENCE FROM ONE SOURCE

HEAT TREATMENT EQUIPMENT TECHNOLOGY



Kohnle®



Competence in Engineering and Manufacturing

Engineering & manufacturing of “turnkey” equipment for continuous heat treatment of mass produced components in the range of 5 – 2000 kg/hr (11 – 4.400 lbs/hr) and at temperatures up to 1.180°C (2.156°F) is our business.

We are dedicated to support our customers in their needs to improve and sustain product quality as well as minimize costs involved in heat treatment equipment operation. This starts with appropriate cost & benefit analysis in the early project phase and continues throughout all stages including engineering, manufacturing, assembly and start-up of the equipment.

We serve customers of the following areas on a worldwide basis, e.g.

- Automobile and automotive industry
- Fastener industry
- Bearing industry
- Jewelry & Watches
- Surgical instruments
- Commercial heat treaters
- IT industry

Identification of applicable process technology, production capacity, type and level of automated loading and degree of automated operation are some of the key areas for appropriate planning & engineering of the equipment. Customer specific part geometries, individually specified technical guidelines as well as requirements toward integrated energy

recovery technologies typically complete the profile, based on which we develop the individual equipment concept for each of our customers.

The extensive experience of our project- & design engineers, experts for process technology & metallurgy and technicians for start-up as well as the experience and results, obtained from our test-run equipment as well as the equipment, in operation at numerous customers facilities, are contributing to an ongoing improvement of our equipment.

We are convinced, that teamwork is the best contributor to deliver optimised results.

That is, why we offer our customers throughout the entire engineering phase the possibility, to contribute their ideas as well as to fulfil their request for modifications to a large extent.

Highly motivated & qualified employees take care of manufacturing, assembly and start-up of the equipment as well as training of the customers operators.

After commissioning of the equipment at the customers facility and release for full production, the second phase of relationship is being implemented through spare parts & maintenance services as well as process- and metallurgy related consultant services, available throughout the life span of the equipment.



CUSTOMER SPECIFIC EQUIPMENT FOR INDIVIDUAL APPLICATIONS

Whether it is austempering, carbonitriding, gas carburising, hardening, solution annealing, nitro carburising, brazing under protective gas, recrystallisation annealing, hardening & tempering etc.; economical and reliable solutions always result through & from a high degree of automation of the material flow and carefully selected key components and conveying techniques.

As one of very few suppliers, KOHNLE's range of products in the field of continuous belt type furnaces covers all needs related to type & design of equipment, heat treating process, capacity and type of conveyor belt. The key component "belt", whether it is a very fine mesh belt, or a heavy duty cast link belt, is only sourced from experienced first class vendors.

Perfection for Each Process

When it comes to selecting the right type of atmosphere and related equipment, we can offer a large variety of systems and protective atmosphere applications, ranging from integrated endothermic or exothermic gas generators, ammonia crackers to atmosphere mixing panels for various gases (e.g. hydrogen, nitrogen, argon, nitrogen/methanol) including associated controls.

The request of our customers for highest, assured quality within tight tolerances on the products, processed through our heat treatment equipment is a continuous challenge, which we see as our obligation to meet. The fulfilment of this obligation is resulting in durable, economically and ecologically beneficial state of the art equipment.



Samples of mass produced parts, to be austempered hardened & tempered, carburised or carbonitrided.
Related product lines: 2,3,4,5



Samples of parts to be annealed, brazed.
Related product line: 1



Annealing, hardening of parts made of stainless/Ni/Cr-alloyed steel.
Related product line: 1

TAKE ADVANTAGE OF OUR EXPERIENCE!



Individual Equipment Concepts – Your Requirements Determine It

Fully automated loading-, unloading- and material handling systems for economic as well as careful material flow are part of all equipment line concepts. A large variety of cleaning equipment is available for pre-wash operation (de-phosphating, degreasing) as well as post-wash operation (removal of quenching residues such as oil, polymer, salt).



Quenching, fast & soft cooling systems are being offered, utilising all available quenching and cooling media (oil, polymer, water, salt, gas). In order to ensure a safe discharge out of the quench without losses, again a large variety of discharge conveying systems are available, to be

selected in line with the product range (parts geometry, size and weight). Just to name one special feature: When centrifugal drum type cleaning equipment is the preferred selection for post-wash operation after quenching, the centrifugal drums are being placed into the quenchant directly underneath of the quench chute of the hardening furnace. Therefore from collecting the components for quenching throughout the multiple step post-wash operation, the parts remain in one and the same drum with significantly reduced risk of part losses and transfer delays/mixes. High efficient gas quenching & fast cooling systems have been developed for continuous atmosphere annealing & tempering furnaces, in order to improve the output performance and also reduce significantly the length of the equipment compared to conventional water to gas cooling zones.

All furnaces are available with gas- or electric heating systems, with a large variety of belts as well as in protective atmosphere or non-protective atmosphere versions. State of the art fiber insulation material and light weight fire bricks and high efficient heating systems are general features of all type of furnaces.



Köhnlle®

TRADITION AND PROGRESS – QUALITY WITH SAFETY

Established in 1961, KOHNLE GmbH has been successfully managed until 1989 by the founder and owner, Mr. Wolfgang KOHNLE. In 1989, a U.S. venture capital group took over the company and kept it in its portfolio until 1995. A small group of local, private shareholders today owns the company.

KOHNLE remained to stay at the same location – Birkenfeld/Pforzheim in the northern outbound of the black forest – since the founding year 1961, though its facilities several times underwent modernisation and expansion measures.

The local watch & jewelry industry in the nearby city of Pforzheim and small businesses in the area of surgical instruments in the surrounding area of southern Germany was basically the focus of the company by providing numerous small continuous furnaces to this industry.

By the end of the 70's, KOHNLE re-focussed its business strategy toward larger furnaces and other product lines. The activities also expanded to serve customers nationwide

throughout Germany as well as on export markets in a few cases at that time.

The next major development phase started by the end of the 80's. Fully automated, gas radiant tube heated heat treatment lines with capacities up to 1.000 kg/hr (2.200 lbs/hr) have been successfully put into production. At the same time, the export share on the annual turnover could be significantly increased.

Again, approximately 10 years later, 1999, the next major phase of development has been launched. Major product development and new equipment technology was the focus of the R & D, especially to cover advanced requirements of the automotive industry. New markets overseas have been successfully developed as well as new license agreements have been signed.

The first time in the history of KOHNLE; in 2002 the export share on the annual turnover is by far larger than the domestic portion of the turnover.

The goal for KOHNLE is, based on satisfied customers and reliable technology at an attractive price/performance ratio, to sustain continuous growth and to obtain the top marketleadership.



FLEXIBILITY IS OUR STRENGTH!

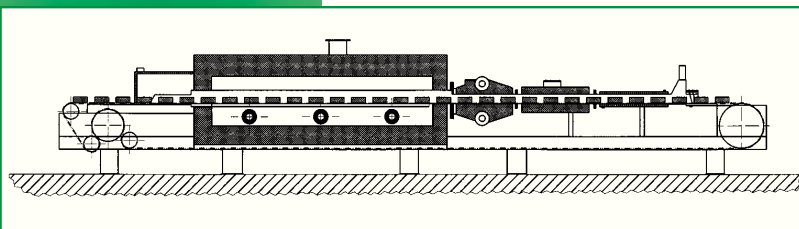
The large variety of customer demands as well as our extensive experience led to the development of 5 different product lines, which are primarily determined by the design and type of the belt furnaces.

Customer specific solutions are being created based on these 5 product lines and a flexible system of standardised sub assembly groups, components and auxiliary equipment.

Ecological and economical aspects as well as durability are the key factors, which we aim to achieve on every single installation.

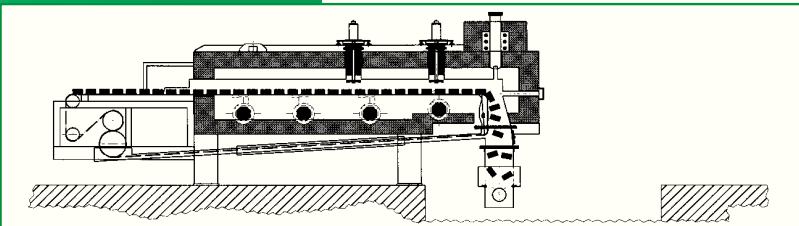
Tell us your needs and we work together with you to determine together with you the best solution to cover your individual requirements.

Please contact KOHNLE's specialists for further specific information or visit our website www.kohnle.de



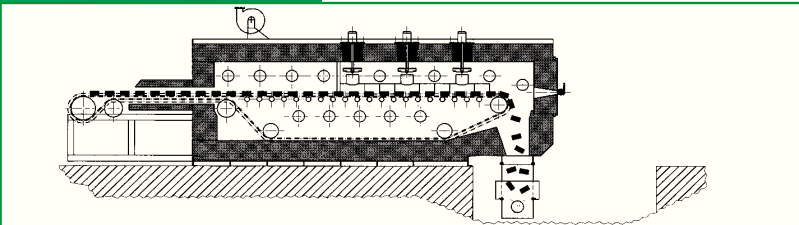
Productline #1

Capacity (hardening): max. 500 kg/hr (1.100 lbs/hr)



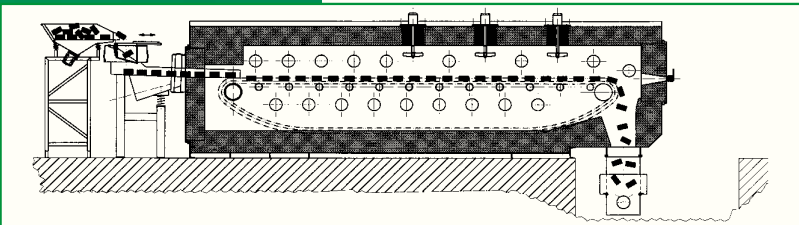
Productline #2

Capacity (hardening): max. 500 kg/hr (1.100 lbs/hr)



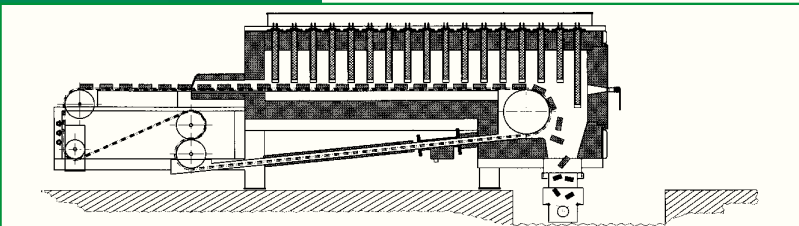
Productline #3

Capacity (hardening): max. 1.000 kg/hr (2.200 lbs/hr)



Productline #4

Capacity (hardening): max. 2.000 kg/hr (4.400 lbs/hr)



Productline #5

Capacity (hardening): max. 500 kg/hr (1.100 lbs/hr)

Continuous Meshbelt Furnace Type: T/HT

For annealing, brazing, hardening, nitrocarburizing, tempering under protective atmosphere and temperatures up to 1.180°C (2.156°F).

Available cooling features:

advanced high convection gas cooling or conventional, indirect water to gas cooling.

Retort Type Meshbelt Furnace Type: BLH

For annealing, austempering, carbonitriding, gascarburizing, hardening, nitrocarburizing under protective atmosphere and temperatures up to 950°C (1.742°F).

Quenching options: oil, polymer, salt and water.

Special features: process area surrounded by metallic (Ni/Cr-alloy) retort, fast changeover in between different process atmospheres. Mesh belt with loading area externally in front of the furnace.

Meshbelt Furnace Type: FH

For annealing, austempering, carbonitriding, gascarburizing, hardening under protective atmosphere and temperatures up to 950°C (1.742°F).

Quenching options: oil, polymer, salt and water.

Special features: mesh belt with loading area externally in front of the furnace with energy recovery system in the entry area (residual heat from the returning belt). Belt advances continuously on supporting rollers with external roller bearings.

Castlink Belt Furnace Type: FHI

For annealing, austempering, carbonitriding, gascarburizing, hardening under protective atmosphere and temperatures up to 950°C (1.742°F).

Quenching options: oil, polymer, salt and water.

Special features: internally circulating cast link belt. Loading via entry vestibule and vibratory chute. Belt advances continuously via drive- & return drum, on supporting rollers with external roller bearings.

Meshbelt Furnace Type: FH-HT

For annealing, austempering, carbonitriding, gascarburizing, hardening, solution annealing under protective atmosphere and temperatures up to 1.180°C (2.156°F).

Quenching options: oil, polymer, salt and water.

Special features: Mesh belt with loading area externally in front of the furnace. Belt sliding area, internal belt drive/return drum made of ceramic coated Ni/Cr/Co/T-alloy.

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