SECO/WARWICK

INVENTION MEETS RELIABILITY

CONTROLLED ATMOSPHERE BRAZING OF ALUMINUM

MISSION

The mission tells us why we exist, for whom we do what we do, why we do it, and what the purpose of the company's existence is.

Thanks to the experience and expertise of our employees as well as cooperation with business partners, we create innovative products that give our customers reliable, safe, and environmentally friendly heat treatment and metallurgy solutions ensuring the economic efficiency of their business.

VISION

The vision is our dream, inspiration, encouragement, stimulus, signpost.

We want to be the first-choice provider of heat treatment and metallurgy solutions. Innovation and reliability are evident in the way we think and create anywhere in the world.

SECOLOGY

The ECO prefix is inscribed in our name and the Group's DNA. We do not talk and do not think differently about ecology other than Secology, because we look at environmental protection so broadly.

Secology is therefore a set of projects and ecological social initiatives, ecological investments within the company and the green technologies that we use or create.

Secology, thus, is not a new science or strategy, it is the SECO/WARWICK Group's attitude visible in various aspects of its operation.

For over 100 years, the SECO/WARWICK Group has been building the global heat treatment and metallurgy industry by providing industrial furnaces for leading companies in the following sectors: aviation, automotive, machinery, medical, toolmaking, power, and commercial heat treatment.

The company specializes in end-to-end solutions in 5 categories: vacuum heat treatment, aluminum thermal processing, atmosphere thermal processing, brazing of heat exchangers, and vacuum metallurgy.

Our solutions help to produce control system components, gears, aircraft landing systems, turbines, aircraft engine blades, plane and car heat exchangers, surgical instruments, and coins, as just a few examples of heat treatment and metallurgy applications.

DISCOVER OUR CONTROLLED ATMOSPHERE BRAZING SYSTEMS

CONTENT

CAB FURNACES

– GENERAL INFORMATION

Controlled atmosphere brazing of aluminum (CAB), using a noncorrosive flux, is the preferred process for manufacturing aluminum heat exchangers. Since entering this field in 1983, SECO/WARWICK has led the development of advanced technology in the continuous flow brazing process.

Capitalizing on over 100 years of furnace design experience, SECO/WARWICK has driven innovations such as improved muffle design, convection heating technology, continuous atmosphere control systems, energy-saving designs, system rebuilds, and upgrades feasibility studies.

These innovations, along with others, have led to the design of a variety of brazing furnace systems to meet the growing demand for aluminum brazing.

We offer optimal solutions for all types of industrial heat exchangers manufactured in long-run, medium-run, or individual short-run production.

/ INDUSTRIES

automotive, engineering, energy, electronics.

/ ESSENTIAL FEATURES

Specialized aluminum brazing or heat treatment lines built to individual requirements. Customization of processes to the specificity of the batch, performance and quality requirements. Process time reduction, energy and other energy factors consumption minimization, meeting customer-specified standards, such as aviation, automotive, environmental and other. Dedicated peripherals: load transport, interoperation cleaning, flux application, packaging, harmful substances emissions reduction.

/ ELEMENTS OF CAB LINE

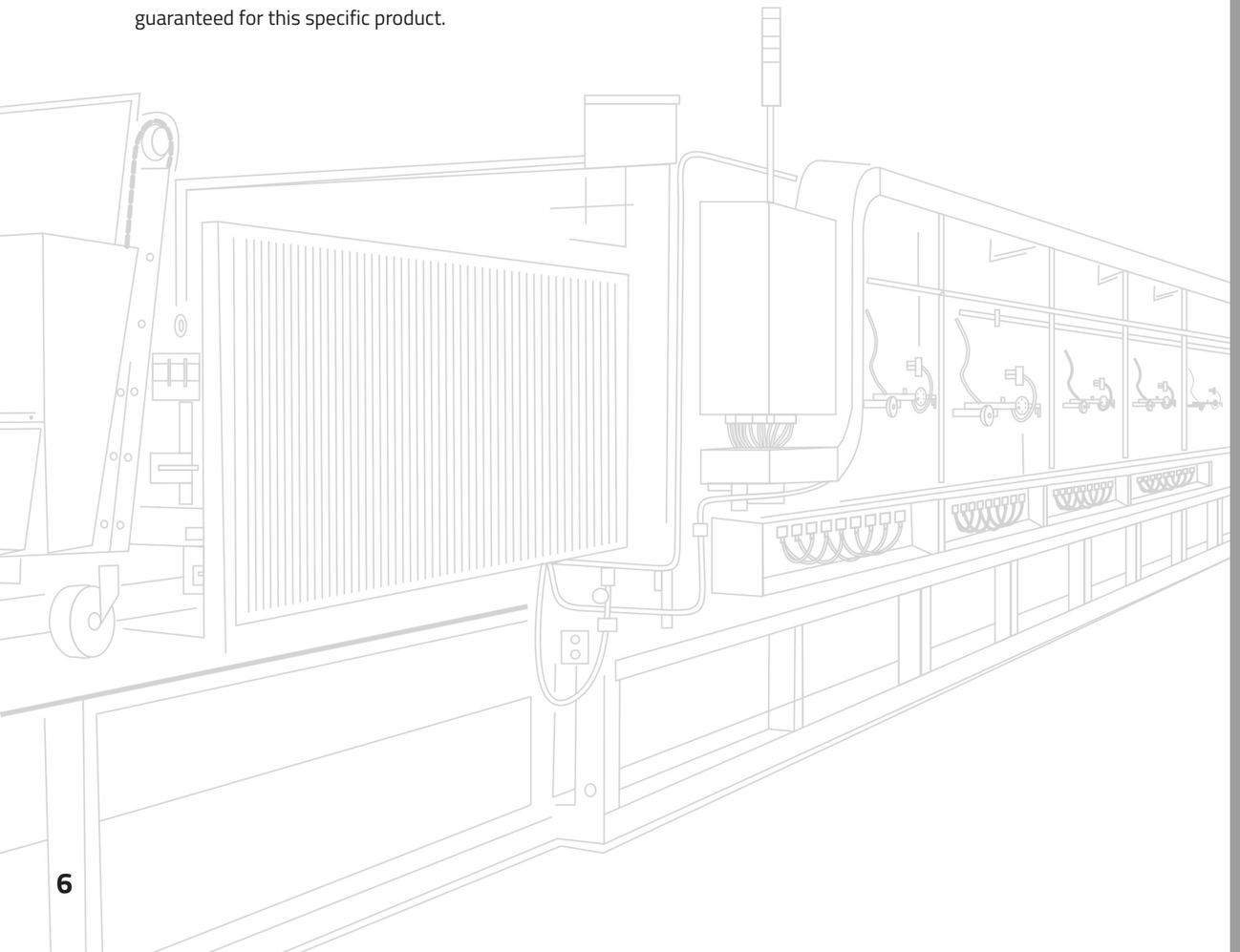
degreaser, flux spray system, dryer and CAB brazing oven. Depending on the client's spatial and logistic requirements, these units can be set up in a straight line, closed loop together with a conveyor system, U-shaped or L-shaped.

EV/CAB

EV/CAB is CAB answer for e-mobility, a system designed to braze large-size car battery coolers for the EV electric car industry.

Green electromobility thanks to EV/CAB:

/ Supports the development of electromobility.
/ Fits in with the trend and the obligation to care for reducing exhaust emissions and for the natural environment.
/ Thanks to independently controlled heating and cooling zones, corrugated muffle design, unique curtain chambers and many other design features, excellent and stable brazing conditions are guaranteed for this specific product.



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EV/CAB

DESIGNS FOR E-MOBILITY

INDUSTRIES
/ Automotive
/ Power

ADVANTAGES
/ Answer for e-mobility - EV/CAB
/ Larger volume production runs
/ Heated muffle to braze the product with high overall efficiency
/ Several independently heated zones
/ Variable speed drive and stainless steel mesh belt are used to move product
/ Thermal afterburner to reduce VOC emissions for degreasers
/ Scrubber with active aluminum oxide deposit to reduce the emission of hydrogen fluoride generated during brazing process
/ Control – IDLE and WEEKEND furnaces operating modes

EV/CAB EV/CAB is CAB answer for e-mobility, a system designed to braze large-size car battery coolers for the EV electric car industry.

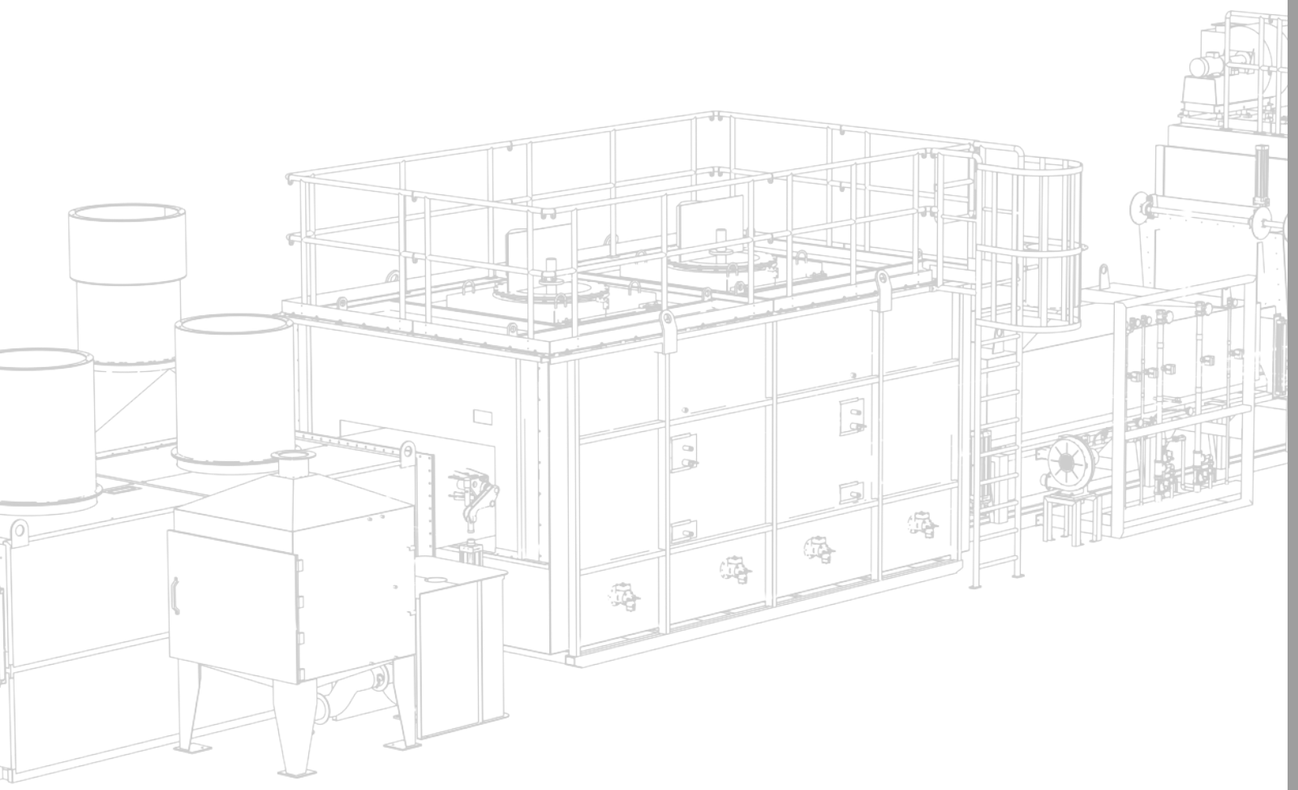
Continuous CAB furnaces use a variable speed drive and a stainless-steel mesh belt to move products. The controlled atmosphere brazing (CAB) process heats a product to brazing temperatures while maintaining uniform temperatures within the product in an oxygen-free nitrogen atmosphere.

The following furnace designs are available to produce a variety of parts in larger volume production runs:
/ Radiation CAB furnace
/ Convection / Radiation CAB furnace
/ Full Convection CAB furnece

ACTIVE ONLY

The semi-continuous furnace system is designed to operate on a part-time basis. The furnace can be brought up to brazing temperature from ambient and conditioned with a proper atmosphere in a very short time.

This semi-continuous system allows for variable heating and cooling rates, depending on indexing times. This furnace can braze the widest variety of heat exchangers when lower total production requirements are needed.



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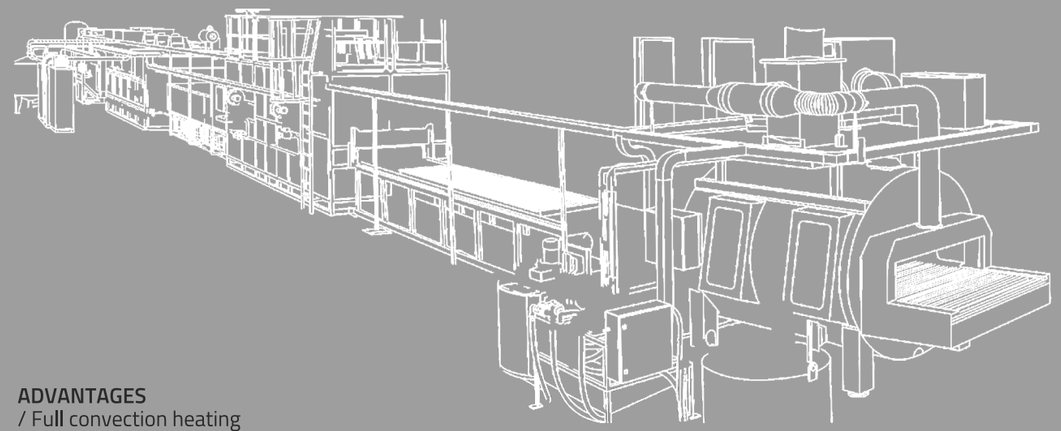
Active Only

SEMI – CONTINUOUS BRAZING FURNACES FOR ALUMINUM

FEATURES
/ Uniquely designed indexing furnace for brazing of the heat exchangers (Plate&Bar type) in vertical position
/ Furnaces in semi-continuous configuration can be equipped with vacuum purging

INDUSTRIES
/ Automotive
/ Power
/ Commercial HT



ADVANTAGES
/ Full convection heating
/ Based on a multi-step indexing cycle - semi-continuous
/ Allows for variable heating and cooling rates, depending on indexing times
/ Can braze the widest variety of heat exchangers
/ Allows to braze a large size of heat exchangers
/ For gas-heated solutions, energy recovery systems reducing gas consumption and thus CO_2 emissions
/ Electric heating systems instead of gas heating systems (including modification of current equipment) to reduce Co_2 emissions
/ Control – IDLE and WEEKEND furnaces operating modes

ActiveOnly The semi-continuous furnace system is designed to operate on a part-time basis.

Active Only Convection CAB Furnaces
are based on a multi-step indexing cycle. The indexing positions include the load table position, the dry off oven the entrance purge chamber, the patented convection preheating and brazing chambers, the air jacketed cooling/exit purge chamber and the airblast chamber. The product runs in a horizontal position with an infinitely adjustable dwell time based on the hearth load and load configuration. A thermocouple work zone monitors recovery time when the load is run intermittently. This system includes innovative features to improve brazing efficiency. The load thermocouples are predicting the actual temperature of the product. It allows for automatic control of the required heating time for different types of the heat exchangers. The furnace ensures a uniform preheat of product through a patented convection muffle configuration. The indexing mode of work ensures the good temperature uniformity even for big size products (HVAC, battery coolers), thanks of fast transport between cold and hot zones.

Universal CAB Batch

Two basic types of batch models are available in a variety of configurations in the standard batch CAB plus the optional units using vacuum purging. The commonly used two-chamber atmosphere batch system allows for variable heating and cooling rates, depending on product requirements. One chamber provides purging and cooling in the nitrogen atmosphere while the other chamber is the convection-heated brazing furnace. To get the proper atmosphere parameters, several exchanges of the volume in the entrance chamber is required in the standard batch CAB unit.

The same level of an atmosphere can be reached by using a vacuum purging option saving dozens cubic meters of nitrogen per cycle. Two chamber vacuum purging units can also be upgraded later to three chambers unit for economically increasing the output. Other components may be added like degreasing/ drying/debinding oven, fluxer, transfer systems, final cooling, and computer controls.

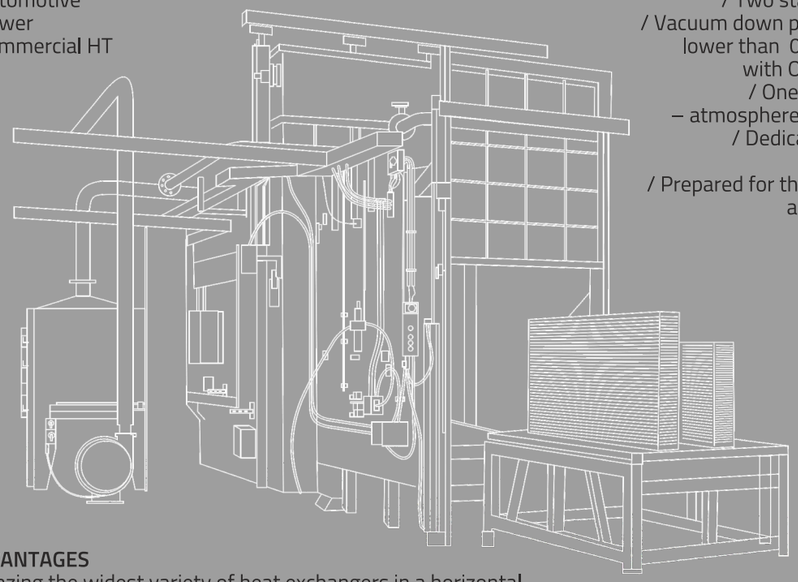
SECO/WARWICK

Universal CAB Batch

DESIGNED TO BRAZE THE WIDEST VARIETY OF HEAT EXCHANGERS

INDUSTRIES
/ Automotive
/ Power
/ Commercial HT

VACUUM PURGING SYSTEM
/ Two stages vacuum pumping
/ Vacuum down purging to the pressure lower than 0,05 mbar corresponds with Oxygen content 10ppm
/ One time refill by Nitrogen – atmosphere quality below 20ppm.
/ Dedicated for the Plate&Bar heat exchangers
/ Prepared for the brazing with fluxless and fluxfree technology



ADVANTAGES
/ Brazing the widest variety of heat exchangers in a horizontal or vertical position depending on the product design requirements
/ Operates on a part-time basis and produces the highest quality parts with the standard or vacuum purge options
/ Can be brought up to brazing temperature from ambient and conditioned to a proper atmosphere in a very short time
/ Electric heating systems instead of gas heating systems to reduce CO_2 emissions
/ Non-emission cooling systems based on air jacket instead of a closed water circuit
/ Control – IDLE and WEEKEND furnaces operating modes

Universal CAB Batch

High brazing quality for low volume producers

OVERVIEW
The Universal CAB Batch Furnace provides high aluminum brazing quality for lower volume producers. It is designed to braze the widest variety of heat exchangers in a horizontal or vertical position depending on the product design requirements. It operates on a part-time basis and produced the highest quality parts with the standard or vacuum purge options, respectively. The furnace can be brought up to brazing temperature from ambient and conditioned to a proper atmosphere in a very short time. The batch system allows for variable heating and cooling rates, depending on product requirements.

SECO/WARWICK
Invention Meets Reliability

SECO/WARWICK is the 1st choice supplier
of solutions for heat treatment and metallurgy.

We create innovative products that provide our customers with reliable, safe and environmentally friendly solutions for heat treatment and metallurgy and ensure the economic efficiency of their businesses. Expertise includes end-to-end solutions in 5 categories: vacuum heat treatment, atmosphere, and aluminum thermal processing, controlled atmosphere brazing of aluminum heat exchangers and vacuum metallurgy.

SECO/WARWICK Group, with 8 companies located on 3 continents, has customers in nearly 70 countries with more than 4000 deployed solutions. The company provides standard or customized state-of-the-art heat processing and metallurgy equipment and technologies to leading companies in the following industries: automotive, aerospace, electronics, tooling, medical, recycling, energy including nuclear, wind, oil, gas, solar and production of steel, titanium, and aluminum.

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