SECO/WARWICK manufactures custom engineered aluminium log and billet homogenizing furnaces for most process applications.

Equipment designs include batch types (both car and tray designs), traveling styles and continuous styles, complete with material handling systems and load cooling equipment.

Unique reversing airflow designs and temperature control systems produce fast heating rates with close temperature uniformity throughout the entire load.

**Batch**

With the batch type design, typically an electrically driven insulated car is used to move a load into and out of the furnace. Often, a double-ended furnace (door at each end) is used with two cars so turnaround time is reduced, thus maximizing production. The alternative to the car bottom design for the batch type units is the tray design. With this design, the load tray rests on a series of support piers within the furnace. A charge machine/transfer car is used for charging/discharging of the tray and transferring the tray from the furnace to a cooling station or to a load/unload station.

A third type of batch unit is the traveling furnace. This furnace uses a pair of fixed load bases to support the load. When the cycle is completed on base No. 1, the furnace moves into position over the second load base and immediately begins heating a new load. The previous load is allowed to cool, then is unloaded and replaced with a new load. This can all be accomplished before the next homogenizing cycle is completed. A traveling furnace provides savings in floor because the two load bases require significantly less floor space compared with a double-ended stationery furnace with two load cars.

**Continuous**

Continuous log homogenizers are used by plants having higher production levels of product to be homogenized. High velocity slot heating is used to heat individually each log to homogenizing temperature very quickly. This design uses charging equipment to load one log at a time into a walking beam furnace. The logs are advanced through the heating and soaking chambers on specially designed hearth saddles to reduce friction and improve straightness. At the discharge end, each log passes through a specially designed quench chamber and then onto the accumulator table. Automatic controls adjust movements, timing and cycle parameters according to log diameter. SECO/WARWICK can also provide the auxiliary equipment for a complete system.

**Airflow Patterns**

The patented reversing airflow design with upstream/downstream temperature control using an axial flow fan wheel reverses rotation on a timed basis, which, in turn, reverses the direction of the horizontal airflow through the load. The air stream temperature is monitored and controlled on each side of the load. A thermal head is used during the early stages of the cycle for fast, efficient heating. This design increases both the heating rate and temperature uniformity of the load compared with one-way airflow, resulting in better efficiency, lower fuel cost, and improved metallurgical results.
SECO/WARWICK holds the patent on the adjustable airflow baffle. These movable baffles greatly increase furnace performance, especially when less than the maximum size loads are being homogenized. The baffles are adjustable according to the height of the load to effectively limit or block the open space that exists above the load. The blocking of the airstream forces the recirculated air to pass through the spacing between each layer of logs or billets rather than taking the path of least resistance over the top of the load. Thus, an increased airstream velocity through the load is created, providing faster heat transfer and improved load temperature uniformity. One side of each movable baffle is fixed to the stationary horizontal baffle by an engineered hinge arrangement. The other side is connected to roof mounted electric operators. The operators include position transducers and limit switches to provide location information to a PLC. Benefits of the adjustable baffle include:

- Shorter heat up rates due to increased airflow velocity
- Preventing short circuiting of the airflow when less than the maximum size load is homogenized
- Preventing overheating of the top layer
- Lower energy requirements since faster heat-up rates are achieved
- Increased uniformity since the airflow is channeled more evenly across all load surfaces

Cooling after homogenization can add significant value to the logs or billets. Production requirements are requiring faster, more uniform cooling of the logs or billets. Evidence increasingly shows that the resulting grain structure and workability properties of the billets are a result of the cooling medium to used after homogenization. While fast cooling is desirable, it must also be uniform throughout the load space or significant bowing of the logs could occur. For batch type loads using a car or tray, SECO/WARWICK offers a variety of load cooler designs such as one-way airflow, reversing airflow, air/mist arrangements, etc., depending on the level of performance required. These chambers are designed to cool the load uniformly to your specifications. Loads are usually plunge cooled at rates that can approach 700°F/hr in the initial stages of the cycle. The cooling rate can also be controlled using variable speed cooling fans.
Aluminium Homogenizing
Furnaces

SECO/WARWICK Group

POLAND
SECO/WARWICK S.A.
Sobieskiego 8
66-200 Świebodzin, Poland
tel. +48 68 3819 888
fax +48 68 3819 805
aftersales-europe@secowarwick.com
www.secowarwick.com

POLAND
SECO/WARWICK Europe Sp. z o.o.
Świerczewskiego 76
66-200 Świebodzin, Poland
tel. +48 68 3819 888
fax +48 68 3819 805
aftersales-europe@secowarwick.com
www.secowarwick.com

CHINA
SECO/WARWICK RETECH
Thermal Equipment Manufacturing (Tianjin) Co., Ltd.
78 Second Xeda Road
Tianjin, China 300385
tel. +86 22 238 28 300
fax +86 22 238 28 305
aftersales-china@secowarwick.com
www.swretech.com.cn

INDIA
SECO WARWICK Allied Pvt. Ltd.
5th Floor, Anmotex IT Park
Road No. 8, Wagle Estate
Thane (W) - 400 604, India
tel. +91 22 6730 1400
fax +91 22 6730 1488
swa-info@secowarwick.com
www.secowarwick.com

USA
SECO/WARWICK Corp.
P.O. Box 908
Meadville, PA 16335-6908, USA
tel. +1 814 332 8400
fax +1 814 724 1407
aftersales-usa@secowarwick.com
www.secowarwick.com

USA
RETECH SYSTEMS LLC
100 Henry Station Rd.
Ukiah, CA 95482, USA
tel. +1 707 462 6522
fax +1 707 462 4103
aftersales@retechsystemsllc.com
www.retechsystemsllc.com

BRAZIL
SECO/WARWICK do Brasil Industria de Fornos Ltda.
Parque Industrial II
Jundiaí, SP - Brasil
CEP: 13213-170
tel. +55 (11) 3109-5900
fax +55 11 4525-1047
aftersales-brasil@secowarwick.com
www.secowarwick.com

RUSSIA
SECO/WARWICK Rus
Plyuzheviiskiy pereulok, bld 5/1,
office № 400
119017 Moscow, Russia
tel. +7 499 788 9721
aftersales-russia@secowarwick.com
www.secowarwick.com

BELARUS
SECO/WARWICK OOO Minsk Office
8 Mielnikajte str., office 26
220004 Minsk, Belarus
tel./fax: + 375 17306 23 71
aftersales-europe@secowarwick.com
www.secowarwick.com

GERMANY
SECO/WARWICK Service GmbH
An der Molkerei 15
D-47551 Bedburg-Hau, Germany
tel. +49 (2821) 713 100
fax +49 (2821) 713 10-29
aftersales-germany@secowarwick.com
www.secowarwick.com

POLAND
SECO/WARWICK Europe Sp. z o.o.
Świerczewskiego 76
66-200 Świebodzin, Poland
tel. +48 68 3819 888
fax +48 68 3819 805
aftersales-europe@secowarwick.com
www.secowarwick.com

USA
SECO/WARWICK Corp.
P.O. Box 908
Meadville, PA 16335-6908, USA
tel. +1 814 332 8400
fax +1 814 724 1407
aftersales-usa@secowarwick.com
www.secowarwick.com

CHINA
SECO/WARWICK RETECH
Thermal Equipment Manufacturing (Tianjin) Co., Ltd.
78 Second Xeda Road
Tianjin, China 300385
tel. +86 22 238 28 300
fax +86 22 238 28 305
aftersales-china@secowarwick.com
www.swretech.com.cn

INDIA
SECO WARWICK Allied Pvt. Ltd.
5th Floor, Anmotex IT Park
Road No. 8, Wagle Estate
Thane (W) - 400 604, India
tel. +91 22 6730 1400
fax +91 22 6730 1488
swa-info@secowarwick.com
www.secowarwick.com

BRAZIL
SECO/WARWICK do Brasil Industria de Fornos Ltda.
Parque Industrial II
Jundiaí, SP - Brasil
CEP: 13213-170
tel. +55 (11) 3109-5900
fax +55 11 4525-1047
aftersales-brasil@secowarwick.com
www.secowarwick.com

RUSSIA
SECO/WARWICK Rus
Plyuzheviiskiy pereulok, bld 5/1,
office № 400
119017 Moscow, Russia
tel. +7 499 788 9721
aftersales-russia@secowarwick.com
www.secowarwick.com

BELARUS
SECO/WARWICK OOO Minsk Office
8 Mielnikajte str., office 26
220004 Minsk, Belarus
tel./fax: + 375 17306 23 71
aftersales-europe@secowarwick.com
www.secowarwick.com

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