Roller Hearth Furnaces

SECO/WARWICK roller hearth furnaces are designed to heat treat a wide variety of products economically with uniform, repeatable results. There's a wide range of sizes of electric or fuel-fired heating systems with matched cooling sections and material handling systems. Coupled with protective atmosphere to keep product clean, or to assist in surface treatments, the roller hearth furnace is a powerful tool for today's manufacturing environment.

Figure 1 Roller hearth for billets & plates

Experienced SECO/WARWICK process specialists will help you select the right combination to meet your production cycle and application requirements. This assures you of receiving a furnace of optimum design for high quality, increased production with minimum investment and operating costs.

Typical Applications for Continuous Systems

- Annealing
- Hardening
- Tempering
- Reheat
- Normalizing
- Stress Relieving
- Brazing
- Carburizing
- Sintering
- Curing

Continuous, Unlimited Work Flow

The SECO/WARWICK roller hearth conveyor system consists of a series of externally driven rolls. There are no cumulative conveyor pressures or tensions as in belt, chain or pusher furnaces. As a result, there are no production or cycle limitations and the length of the furnace is dependent only upon your application needs. Individual operation of the roll sections permits continuous or interrupted work flow.

Figure 2 Fully automated material handling system

Continuous Systems Combine the Quality of Batch Processing with Unmatched Production Capability

The advanced construction design features of these furnaces let you increase both the quality and rate of your production. Atmosphere integrity is assured through welded gas-tight shells, sealing doors and pressure control systems. Loads are indexed and run through reliably. Uniformity is met by proper heating design (convection is also used at medium process temperatures if needed); fast and slow cooling rates are possible; pre-heating can be employed; follow-on surface treatment like steam blue is possible – the capabilities are endless. If you can batch process it, we can probably do it more efficiently with continuous flow.

Figure 3 Continuous transformer core annealing

Ease of Installation

Furnace sections are completely assembled at the factory with insulation, heating systems, piping, wiring and rolls. The skid mounted sections can be moved quickly and easily into place, welded or bolted together and placed in operation. Assembly by highly skilled factory staff using the right tools, jigs and fixtures assures greater attention to workmanship and design details, eliminating many of the problems frequently encountered with field construction.

Approach to Extend Component Life

Because individual conveyor rolls are externally driven and remain in the same temperature zones, they are not subject to thermal cycling and can be designed for maximum operation life at working temperatures. In addition, cumulative pressures on conveyor rolls, work trays and workloads are eliminated. Furnace doors are specially constructed and insulated for operation within the temperature zones in which they are located, minimizing stress and warpage caused by temperature differences. Heating and cooling sections incorporate dependable, high- quality components for long life operation. Factory assembly of furnace sections eliminates many problems often encountered with field assembly.

Figure 4 Roller Hearth Furnace System for tube and pipe annealing

Flexible Operation

Individual roll sections can be started, stopped, reversed or oscillated; they can be run at the same or at different speeds. This permits an operating furnace that produces your required cycle in a minimum amount of space. High-speed transfer between sections allows closely spaced workloads or work trays with separation during transfer through doors, assures optimum use of hearth space and minimizes atmosphere mixing. All door openings can be adjusted to workload heights, permitting faster operation and minimizing atmosphere mixing.

Figure 5 Furnace rub rails protect both the furnace walls and product while traveling through the furnace

Lower Production Costs Compared to Batch Furnaces

The wide selection of furnace combinations and sizes means that you can get the furnace designed for your needs. You can cut costs through increased product quality and rate of production.

Benefits of Continuous Operation

- Batch systems require constant heating and cooling. This wastes energy and stresses materials
- Batch material handling is difficult to automate
- Energy recuperation is easier and less costly with continuous systems
- Continuous takes up about half of the floor space than multiple batch units
- Longer equipment life – typically 40+ years

Factory assembly means lower cost installation and your furnace is in production more quickly. In addition, the best construction materials and design mean minimum maintenance.

Designed to Meet Your Needs

- Temperature ranges from 400^0F – 2250^0F (200^0C – $1,200^0$C)
- Suitable for atmospheres from air or products of combustion to exothermic (EXOGAS™), Endothermic (ENDOGAS™), Nitrogen/Hydrogen or Ammonia (AMMOGAS™) or steam
- Throughputs are unlimited but typically from 500 pounds (225 kg) to 15,000 pounds (6,800 kg) per hour

Industrial Services

A wide range of services are available for our equipment. These include rebuild projects, field service, spare parts, equipment supply, control and combustion upgrades, and fabrication services. As a result of these services, we have provided our customers improved performance, lower emissions, better efficiency and enhanced product temperature uniformity.

The latest design, materials, and equipment specifications should be obtained from the company before any reliance is placed on this standard bulletin since changes may occur due to product improvement.

About SECO/WARWICK

The SECO/WARWICK Group provides industrial metal heat treatment furnaces used in a variety of processes for material finishing and component manufacturing applications. We supply furnaces to customers involved with steel, titanium and aluminum production as well as aluminum recycling, forging, automotive, aerospace, commercial heat treating, HVAC/R, electronics, wind energy, medical equipment and nuclear industries.

The SECO/WARWICK Group produces vacuum furnaces, atmosphere furnaces, controlled atmosphere aluminum brazing furnaces (CAB), aluminum process furnaces and vacuum metallurgy equipment in manufacturing sites in Poland (SECO/WARWICK Europe), the United States (SECO/WARWICK Corp., RETECH Systems LLC), India (SECO/WARWICK Allied Ltd.), China (SECO/WARWICK RETECH Mfg. Tianjin Co., Ltd.) and Brazil (SECO/WARWICK do Brasil Ltda.). Sales, service & spare parts offices in Germany (SECO/WARWICK Services GmbH) and Russia (SECO/WARWICK Russia) complete the worldwide customer care network. Visit our website below for more information.