Solar Manufacturing
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HCB-2EQ Series
Horizontal Car Bottom Vacuum Furnace

Features and Benefits
- Front and rear hinged autoclave-type doors for loading / unloading from both ends of the furnace
- Work zone sizes: Width x Height x Depth:
  54" W x 54" H x 144" D 50,000 pound capacity
  54" W x 54" H x 288" D 100,000 pound capacity
  54" W x 54" H x 432" D 150,000 pound capacity
  80" W x 80" H x 432" D 150,000 pound capacity
  Other sizes available as required
- Uniformity of ± 10°F throughout hot zone
- Super energy efficient graphite insulation hot zone for high temperature applications up to 2500°F
- Thin segmented graphite resistance heating elements for uniform radiant heat up and cool down
- Dual* high performance external gas quenching systems provide high velocity, 2 bar cooling of large work loads
- Front and rear transfer cars provide safe, powered loading / unloading of car bottoms and work loads
- Fully automated and programmable industrial controls package
- Designed for long life, easy maintenance, minimal downtime, and low cost of operation

(*Single quench system for 144" deep furnace model)

Specifications
The HCB-2EQ model is a horizontal car bottom vacuum heat treating furnace specifically designed for large, heavy work loads. It is a high temperature, high vacuum, batch-type furnace with electric resistance heating elements both in the circular hot zone and the full length of the car bottoms.

Hot Zone
- Operating temperature: 2500°F
- Maximum temperature: 2650°F
- Temperature uniformity: approximately ±10°F
- Hearth: molybdenum pins and graphite rails
- Heating elements: Thin, curved, segmented graphite heating elements in the circular hot zone
  Thin, flat, segmented graphite heating elements along the full length of the car bottoms
- Insulation: Four (4) layers of 0.5" thick high purity graphite felt surround the circular hot zone
  Six (6) layers of 0.5" thick high purity graphite felt mounted on the front and rear doors and car bottoms
- Hot Face: 0.040" (5mm) thick Flex Shield carbon fiber reinforced graphite foil sheet
- Five (5) zones of trim control
- Insulation and heating elements are mounted on a heavy duty, stainless steel support structure

Vacuum Chamber
Double wall, water cooled, horizontal vacuum chamber has front and rear hinged doors with pneumatically operated autoclave-type locking rings to permit the furnace to safely quench at positive pressures up to 15 PSIG (2 bar). Oversized water inlets and outlets assure maximum water flow.

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Gas Quenching System
Dual* low resistance, high efficiency external gas quench systems provide high velocity cooling of up to 15 PSIG (2 bar) of large heavy work loads. Each quench system features an appropriately sized motor which drives a high performance radial blower to re-circulate the quench gas straight through a water-to-gas heat exchanger and then through the hot zone's tapered graphite gas nozzles. The nozzles are specifically directed at the work load for optimum cooling efficiency. Dual gas return pipes are sized to reduce pressure drop. A variable speed drive provides process flexibility.

(*Single quench system for 144" deep furnace model)

Vacuum Pumping Systems*
- Mechanical Pumps:
  Two (2) Edwards Stokes 412, 300 CFM
- Booster Blowers:
  Two (2) Edwards Stokes 615, 1600 CFM
- Diffusion Pumps: Two (2) 35" Varian
- Holding Pumps: Two (2) Alcatel
- High Vacuum Valves: Two (2) 48" Diameter

(*Single pumping system for 144" deep furnace model)

Power Supply
- Angle fired SCR, 460 volt, 3 phase, 60 Hz
- Air cooled for reduced maintenance

Control Cabinet and Instrumentation
All industrial controls and instrumentation are housed in a suitable NEMA 12 control cabinet. The SolarVac 3000 interactive control system enables the operator to monitor, control, record, and display information graphically to quickly understand the status of the furnace.

- Programmable Logic Controller:
  Allen-Bradley MicroLogix 1500
- Programmable Controller:
  Honeywell Model DCP551
- Overtemperature Controller:
  Honeywell Model UDC2500
- Graphic Video Recorder:
  Eurotherm Model 6180 utilizing a 12" color touch-screen monitor
- Operator Interface: Allen-Bradley PanelView Plus 1500 utilizing a 15" color touch-screen monitor
- Vacuum Gauge Controller: Televac MC300
- Control Thermocouples: Type "S"
- Work Thermocouples: Type "K"

Optional Equipment
- ConserVac energy saving pump control system
- Ground Detection System
- Gas backfill reservoir

Additional options are available upon request.

Solar Manufacturing designs and manufactures vacuum heat treating and brazing furnaces with a focus on energy efficiency and durability. As a team of specialists with many collective years of experience, we are committed to our objective of providing vacuum furnaces and hot zones with the lowest cost of ownership achieved through state-of-the-art materials, high performance operation, and robust design.

Solar Manufacturing is a part of Solar Atmospheres, Inc., a progressive company and one of the largest independent commercial heat treaters in the USA. This background affords us a distinct advantage in the industry to assist you in choosing the right vacuum furnace for your application.

For more information or to request a proposal, contact the vacuum furnace specialists at Solar Manufacturing.

SOLAR MANUFACTURING

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