

# External Quench HFL-EQ SERIES



Vacuum Heat Treating & Brazing Furnace



**Energy Efficient**  
Graphite Insulation<sup>1</sup>

**2500°F**  
Max Temperature

**2400°F**  
Max Operating Temperature

**±10°F**  
Temperature Uniformity  
(1000°F-2200°F)

**2 Bar**  
Quench Pressure Capability

**SolarVac®**  
Interactive Controls

The HFL-EQ model is a horizontal front loading, external quench, vacuum heat treating and brazing furnace generally designed for high production commercial and captive heat treating shops. It is a high temperature, high vacuum, batch-type furnace with electric resistance heating elements. All aspects of form, fit and function are designed for easy maintenance and minimal downtime.

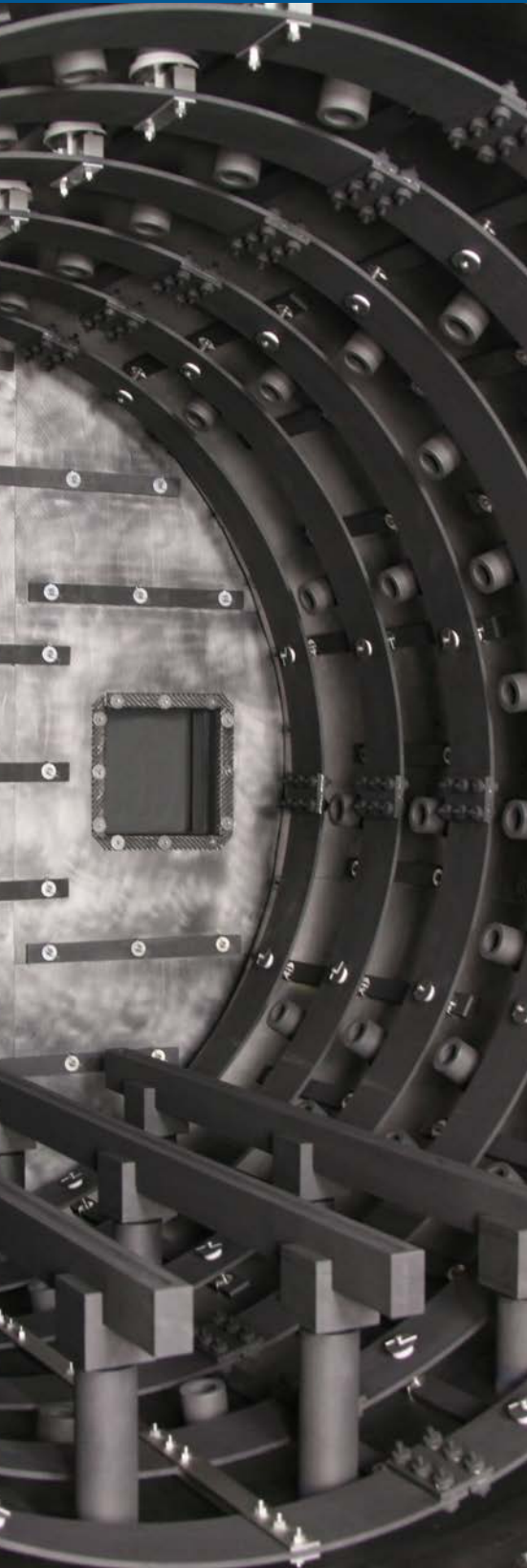
For a detailed price proposal with equipment specification,  
contact Sales at [sales@solararmfg.com](mailto:sales@solararmfg.com) or call 267-384-5040.

 PROUDLY MADE IN THE USA

**THE BRIGHTEST SOLUTIONS THROUGH INGENUITY**

# HFL-EQ Series

## Specifications



### Hot Zone

At the heart of every one of our furnaces is the robust, energy efficient graphite insulated hot zone for process temperatures up to 2500°F.

Operating temperature: 2400°F

Maximum temperature: 2500°F

Temperature uniformity:  $\pm 10^\circ\text{F}$

AMS 2750E compliant

Survey temp points at

1000°F / 1500°F / 2100°F

**Ring Insulation<sup>1</sup>** : four layers of 0.5" thick high purity rayon graphite felt

**Door & Rear Head Insulation<sup>1</sup>** : five layers of 0.5" thick high purity rayon graphite felt

**Hot Face:** one layer of 0.075" thick CFC<sup>2</sup>

**Heating elements:** rugged segmented, curved graphite bands or continuous ML Molybdenum bands

**Hearth:** graphite support pins and graphite rails<sup>3</sup>

**Support Structure:** insulation and heating elements mounted on a heavy duty 304 stainless steel fabrication with heavy duty, back up shields of 0.090" thick

<sup>1</sup> Refractory metal radiation shielded hot zones are available

<sup>2</sup> Other hot face options are available such as graphite foil or graphite FlexShield

<sup>3</sup> Other hearth configurations are available:

*Molybdenum support pins and molybdenum rails*

*Molybdenum support pins and graphite rails*

*(left) This photo displays a typical graphite insulated hot zone with several rear gas exit baffles.*

### Work Zone Sizes Available

**Model HFL-2624-2EQ:**

18"W x 14"H x 24"D

500 pound capacity

**Model HFL-3836-2EQ:**

24"W x 24"H x 36"D

1500 pound capacity

**Model HFL-5748-2EQ:**

36"W x 36"H x 48"D

5000 pound capacity

**Model HFL-6672-2EQ:**

48"W x 36"H x 72"D

6000 pound capacity

**Model HFL-7472-2EQ:**

48"W x 48"H x 72"D

7500 pound capacity

### Vacuum Chamber

Designed for long years of dependable service, our horizontal front loading vacuum chamber is double-walled for water cooling. The front door is hinged for convenient unobstructed loading/unloading of workloads and fixtures.

The pneumatically operated, door closure mechanism is an autoclave-type, rotating locking ring to ensure safe and convenient operation. Oversized water inlets and outlets to allow maximum water flow and ease of drainage. The furnace chamber is designed to operate in deep vacuum as well as safely quench at positive pressures up to 15 PSIG (2 bar).

### Vacuum Pumping System

**Mechanical Pump:** Edwards Stokes Microvac rotary piston

**Booster Blower:** Edwards Stokes direct drive

**Diffusion Pump:** Varian/Agilent

**Holding Pump:** Pfeiffer Pascal Series

**High Vacuum Valve:** Pneumatically operated, right angle poppet valve

## Gas Quenching System

The high performance, external gas quench system provides the lowest resistance, highest efficiency gas flow in the industry for rapid cooling at pressures up to 15 PSIG (2-bar). An appropriately sized motor<sup>4</sup> drives a computer balanced, radial bladed fan to recirculate the quench gas straight through the water-to-gas heat exchanger and then into the hot zone at high velocity. The unique tapered graphite gas nozzles are positioned to direct quench gas at the work load for optimum cooling.

If in the unlikely event it is ever necessary to access or remove the heat exchanger or quench motor or fan wheel, all components can be easily serviced through the appropriate end plates of the separate, external housing.

## Power Supply

Hunterdon Transformer VRT power supply or Magnetic Specialties, Inc. SCR power supply

<sup>4</sup> Motor horsepower ratings will vary dependent upon the model and the desired heat treat process results

## Instrumentation & Controls Automation

Fully automated and programmable interactive controls. All instrumentation and controls are housed in a suitable NEMA 12 industrial enclosure. The SolarVac<sup>®</sup> interactive control systems enable the operator to monitor, control, record, and display information graphically to quickly understand the status of the furnace.

### SolarVac<sup>®</sup> 3000

**Operator Interface:** Allen-Bradley PanelView Plus 6 Model 1500 with 15" color touch panel

FactoryTalk<sup>®</sup> View ME supervisory-level HMI software package

**Programmable Logic Controller:** Allen-Bradley MicroLogix 1500 utilizing RSLogix 500

**Recipe Controller:** Honeywell Model DCP551

**Temperature Controller:** Honeywell Model UDC3500

**Overtemperature Controller:** Honeywell Model UDC2500

**Graphic Video Recorder:** Eurotherm Model 6180A with 18 channels utilizing a 12" color touch screen

**Vacuum Gauge Controller:** Televac MC300

**Control & Over Temp Thermocouples:** Type "S" with ceramic protection tube

**Work Thermocouples:** Type "K" Refrasil insulated, compensated wire

*Optional alternative HMI systems available:*

### SolarVac<sup>®</sup> 4000

**Operator Interface:** Allen-Bradley PanelView Plus 6 Model 1500 with 15" color touch panel

FactoryTalk<sup>®</sup> View ME supervisory-level HMI software package

**Programmable Logic Controller:** Allen-Bradley SLC505 utilizing RSLogix 500

### SolarVac<sup>®</sup> 5000

**Operator Interface:** Industrial PC with an advanced 21.5" TFT color touch panel; Intel Quad Core CPUs; Windows<sup>®</sup> 7 OS

Wonderware InTouch 2014 R2 supervisory-level HMI software package

**Programmable Logic Controller:** Allen-Bradley SLC505 utilizing RSLogix 500

## Equipment and Energy-Saving Options

ConserVac<sup>®</sup> energy-saving control system

ElementGuard off-line heating element protection system

Variable Frequency Drives (VFD) or soft-start motor starters are available in place of across-the-line motor starters for optimum quench motor performance.

Dedicated rail guided load truck; manual or powered

Gas backfill reservoir

Recirculating Water Cooling system

RA330 and molybdenum work grids

*\*Additional options are available upon request.*



VERTICAL  
BOTTOM LOADING

SOLAR  
SUPER QUENCH

INTERNAL  
QUENCH

EXTERNAL  
QUENCH

THE MENTOR

HORIZONTAL  
CAR BOTTOM

**VBL**

**SSQ**

**IQ**

**EQ**

**MIO**

**HCB**

### Process Applications

Hardening | Stress Relieving | Normalizing | Brazing | Annealing  
Tempering | Carburizing | Nitriding | Sintering | Hydriding/De-hydriding

### Industries Served

Aerospace | Commercial Heat Treating | Power Gen | Aircraft Engines  
Heat Transfer | Powdered Metals | Automotive | Medical | Tool & Die



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