The HFL-SSQ model is a high pressure gas quenching horizontal, front loading, vacuum heat treating furnace designed for high production commercial and captive heat treating shops. It is a high temperature, high vacuum, batch-type furnace with electrical 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@solarmfg.com or call 267-384-5040.
Since 2002, commercial and captive heat treaters from a wide variety of industries trust in our ingenuity for their vacuum heat treating. Solar Manufacturing is a world leader in innovative vacuum furnace designs.

**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: ±10°F
- AMS 2760E compliant
- Survey temp points at 1000°F / 1500°F / 2100°F

**Ring Insulation**
- four layers of 0.5” thick high purity rayon graphite felt
- One layer of 0.075” thick CFC²

**Door & Rear Head Insulation**
- five layers of 0.5” thick high purity rayon graphite felt
- 0.090” thick high purity rayon graphite felt

**Heating elements**
- Rugged segmented, curved graphite bands or continuous ML Molybdenum bands
- Heating elements mounted on a heavy duty 304 stainless steel fabrication with heating elements mounted on a heavy duty 304 stainless steel fabrication with heavy duty, back up shields of 0.090” thick

**Multiple zones of trim control**
- Refractory metal radiation shielded hot zones are available
- Other hot face options are available such as graphite foil or graphite FlexShield
- Other hearth configurations are available: Molybdenum support pins and molybdenum rails
- Graphite support pins and graphite rails³
- Molybdenum support pins and graphite rails

**Vacuum Chamber**
The furnace chamber is designed to the ASME Pressure Vessel Code to permit operation in deep vacuum as well as safely quench at positive pressures up to 20 bar. Fabricated 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.

**Vacuum Pumping System**
- Mechanical Pump: Edwards Stokes Microvac rotary piston
- Booster Blower: Edwards Stokes direct drive
- Diffusion Pump: Varian/Agilent
- Holding Pumps: Pfeiffer Pascal Series
- High Vacuum Valve: Pneumatically operated, right angle poppet valve

**Work Zones Sizes Available**

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFL-2624-20ID</td>
<td>18”W x 14”H x 24”D</td>
<td>500 pound capacity</td>
</tr>
<tr>
<td>HFL-3836-20ID</td>
<td>24”W x 24”H x 36”D</td>
<td>1500 pound capacity</td>
</tr>
<tr>
<td>HFL-5748-20ID</td>
<td>36”W x 36”H x 48”D</td>
<td>5000 pound capacity</td>
</tr>
<tr>
<td>HFL-6672-20ID</td>
<td>48”W x 36”H x 72”D</td>
<td>6000 pound capacity</td>
</tr>
<tr>
<td>HFL-7472-20ID</td>
<td>48”W x 48”H x 72”D</td>
<td>7500 pound capacity</td>
</tr>
</tbody>
</table>

**Gas Quenching System**
The new and improved, high performance, internal gas quench system provides the lowest resistance, highest efficiency gas flow in the industry for rapid cooling at pressures up to 20 bar. An appropriately sized motor drives a high-speed radial 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. Variable Frequency Drives (VFD) are available in place of across-the-line motor starters for optimum quench motor performance.

- A fixed rear gas exit baffle is standard equipment for the SSQ 6 bar, 10 bar or 15 bar high pressure quench furnaces.
- A pneumatically actuated sliding rear gas exit baffle is available as an option in place of a fixed rear gas exit baffle.

**Power Supply**
Hunterdon Transformer VRT power supply or Magnetic Specialties, Inc. SCR power supply rated 460 volt/3 phase/60 Hertz

**Instrumentation & Controls Automation**
- Fully automated and programmable interactive controls. All instrumentation and controls are housed in a suitable NEMA 12 industrial enclosure. The SolarVac® interactive control systems enable the operator to monitor, control, record, and display information graphically to quickly understand the status of the furnace.

**SolarVac® 3000**
- Operator Interface: Allen-Bradley PanelView Plus 6 Model 1500 with 15” color touch panel
- FactoryTalk® 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 6160A 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” Frasial insulated, compensated wire

**Equipment and Energy-Saving Options**

- ConserVac® energy-saving control system
- ElementGuard off-line heating element protection system
- 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.*
HFL-SSQ Series

Specifications

Hot Zone
At the heart of every one of our furnaces is the robust, efficient graphite insulated hot zone for process temperatures up to 2500°F. Operating temperature: 2400°F Maximum temperature: 2500°F Temperature uniformity: ±10°F AMS 2760E compliant Survey temp points at 1000°F / 1500°F / 2100°F

Specifications

Graphite Rails
Molybdenum Rails
Molybdenum Support Pins
Graphite FlexShield Hot Zones
Graphite Insulated Hot Zone for Process Furnaces is the robust, energy efficient heating elements mounted on a heavy duty 304 stainless steel fabrication with heavy duty, back up shields of 0.090" thick Multiple zones of trim control

Work Zone Sizes Available†,‡
Model HFL-2624-20IQ: 18"W x 14'H x 24'D 500 pound capacity
Model HFL-3836-20IQ: 24"W x 24'H x 36'D 1500 pound capacity
Model HFL-5748-20IQ: 36"W x 36'H x 48'D 5000 pound capacity
Model HFL-6672-20IQ: 48"W x 36'H x 72"D 6000 pound capacity
Model HFL-7472-20IQ: 48"W x 48'H x 72"D 7500 pound capacity

Other work zone configurations available

† Additional options are available upon request.

Gas Quenching System
The new and improved, high performance, internal gas quench system provides the lowest resistance, highest efficiency gas quench in the industry for rapid cooling at pressures up to 20 bar. An appropriately sized motor drives a high-speed radial 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. Variable Frequency Drives (VFD) are available in place of across-the-line motor starters for optimum quench motor performance.

A fixed rear gas exit baffle is standard equipment for the all SSQ 6 bar, 10 bar or 15 bar high pressure quench furnaces. A pneumatically actuated sliding rear gas exit baffle is available as an option in place of a fixed rear gas exit baffle. The pneumatically actuated sliding rear gas exit baffle is standard equipment for the SSQ 20 bar high pressure quench furnace.

Motor horsepower ratings will vary dependent upon the model and the desired heat treat process results.

All SSQ IQ models available as 6, 10 or 20 bar high pressure quench.

Power Supply
Hunterdon Transformer VRT power supply or Magnetic Specialties, Inc. SCR power supply rated 460 volt/3 phase/60 Hertz

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

SolarVac® 3000
Operator Interface: Allen-Bradley PanelView Plus 6 Model 1500 with 15" color touch panel
FactoryTalk® View ME supervisory-level HMI software package
Programmable Logic Controller: Allen-Bradley MicroLogix 1500 utilizing RSLogix 5000
Recipe Controller: Honeywell Model DCP563
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® 4000
Operator Interface: Allen-Bradley PanelView Plus 6 Model 1500 with 15" color touch panel
FactoryTalk® View ME supervisory-level HMI software package
Programmable Logic Controller: Allen-Bradley SLC500 utilizing RSLogix 500
SolarVac® 5000
Operator Interface: Industrial PC with an advanced 21.5" TFT color touch panel; Intel Quad Core CPUs; Windows® 7 OS Wonderware InTouch 2014 R2 supervisory-level HMI software package
Programmable Logic Controller: Allen-Bradley SLC500 utilizing RSLogix 500

Equipment and Energy-Saving Options*
ConserVac® energy-saving control system
ElementGuard off-line heating element protection system
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.

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