The HFL-IQ model is a horizontal front loading, internal 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@solarmfg.com or call 267-384-5040.
Solar Manufacturing is a world leader in innovative vacuum furnace designs. Since 2002, commercial and captive heat treaters from a wide variety of industries trust in our ingenuity for their vacuum heat treating.

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

**Insulated Hot Zone**
- Four layers of 0.5” thick high purity rayon graphite felt

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

**Hot Face**
- One layer of 0.075” thick CFC

**Heating Elements**
- Graphite rails
- Molybdenum support pins and molybdenum rails

**Hearth**
- Graphite support pins and graphite rails

**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 steel.

**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 Pumps: Pfeiffer Rascal Series
- High Vacuum Valve: Pneumatically operated, right angle poppet valve

**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 15 PSIG (2 bar).
- An appropriately sized motor drives a computer balanced 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 rear motor housing instead of removing the entire hot zone from the front door.

**Power Supply**
- Hunterdon Transformer VRT power supply or Magnetic Specialties, Inc. SCR power supply

**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

**SolarVac® 4000**
- Operator Interface: Allen-Bradley PanelView Plus 6 Model 1500 with 15” color touch panel
- FactoryTalk® View ME supervisory-level HMI software package

**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

**Optional Alternative HMI Systems**
- ConserVac® energy-saving control system
- ElementGuard off-line heating element protection system
- EagleView variable frequency drives (VFDs) 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.*
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- Temperature uniformity: ±10°F
- Temperature: 110°F
- AMS 2760E compliant
- Survey temp points at 1000°F / 1500°F / 2100°F

**HFL-IQ Series Hot Zone**
- exit baffles.
- insulated hot zone with several rear gas

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

**Work Zone Sizes Available**
- **Model HFL-2624-2IQ:** 18”W x 14”H x 24”D
  - 500 pound capacity
- **Model HFL-3836-2IQ:** 24”W x 24”H x 36”D
  - 1500 pound capacity
- **Model HFL-5748-2IQ:** 36”W x 36”H x 48”D
  - 5000 pound capacity
- **Model HFL-6672-2IQ:** 48”W x 36”H x 72”D
  - 6000 pound capacity
- **Model HFL-7472-2IQ:** 48”W x 48”H x 72”D
  - 7500 pound capacity

**Vacuum Chamber**
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- 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).

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**Power Supply**
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**Instrumentation & Controls Automation**
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**SolarVac® 3000**
- **Operator Interface:** Allen-Bradley PanelView Plus 6 Model 1500 with 15” color touch panel
- **Programmable Logic Controller:** Allen-Bradley MicroLogix 1500 utilizing RSLogix 500
- **Recipe Controller:** Honeywell Model DDC563
- **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 MC100
- **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
- SolarVac® 5000

**Equipment and Energy-Saving Options**
- ConserVac® 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.

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**Contact**
- 267.384.5040
- solarmfg.com
Internal Quench HFL-IQ SERIES

Vacuum Heat Treating & Brazing Furnace

Energy Efficient
Graphite Insulation

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

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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