

## Technical Specification for Model RSA1310-6NH11 Atmosphere Conveyor Furnace



HengLi RSA1310-6NH11 belt furnaces are designed for glass to metal seal applications.

### **MAIN CHARACTERISTICS**

Item	Unit	RSA1310-6NH11
Loading Table	mm	600
Pre-Heating	mm	750
Heating Zone	mm	2400
Transition	mm	900
Water Cooling	mm	1300
Transition	mm	450
Unloading Table	mm	600
Total Length	mm	7000
Zones		6
Power	KVA	36
Belt Width	mm	125
Opening Height	mm	100
Gas Inlet		8
Main Application	Glass to Metal Seal	
Production Volume		Medium Volume Production
Other available upgrade (extra charge may apply)	Zones	4-8 zones
	Belt Width	90~150 mm

The quoted unit features 2400mm of heated length comprised of 6 independently controlled heat zones. Each zone is 400mm in length. The process chamber in this model is able to maintain a gas tight atmosphere. Process materials are carried through the furnace on a 125mm (5 inches) wide belt with



75mm (3.00 inch) of product clearance over the belt. A VGA Color Graphic Monitor, personal computer and Windows XP based furnace control software are installed for temperature and conveyor speed monitoring, profile setting and recipe storage. The CPU and monitor are mounted on a swing arm at the exit end of the furnace. Each furnace zone is monitored and controlled using a type "K" thermocouple in the center of each heated zone. These ports connect to the Microprocessor, described above, so that profiling thermocouples can be connected and used with the software to capture, display, printout, and store profiles. Product cooling is accomplished by utilizing a graduated water cooling module, including exit N2 curtain and baffle assembly. The standard cooling method for the graduated cooling module is facility water at 30LPM/2~4 BAR. Air cooling may be specified at no additional charge.

### **ADVANTAGES**

Rated to 1,050° C, the RSA Series has a high-temperature muffle for clean application and features an ultra-clean low-mass refractory heating chamber. The RSA1310-6NH11 heats from ambient to 1,050° C in approximately 60 minutes, and is designed to sustain continuous on/off heating and cooling cycles resulting from alternating periods of production and nonuse. HengLi RSA Series is an energy efficient precision thermal processing system that provides unequaled performance through features such as:

1. 6 channel temperature profiler unit for independent temperature profiling. Includes 3 T.C., sampling unit and analyses software, LCD data display and check, RS232 interface to computer.
2. Atmosphere distribution and management system eliminate thermal shock and process contamination.
3. High-temperature muffle for a clean application.
4. Ultrasonic belt cleaning system including drying system.
5. Windows XP DSC based profiling and monitoring system for monitoring, recording the firing process, including temperature and speed.
6. UPS for the computer system and conveyor drive for power failure.
7. Extraction of burn-off effluents across entire chamber width improves yields.
8. Stable, special temperature uniformity control ensures consistent "firing" results.

### **TEMPERATURE PROFILE**

Ramp up to 1050° C. in more than 50° C per minute with a 5 to 10 minutes at that temp and then cool in slow cooling rate to about 700° C and then fast cooling to close to room temperature.

### **PERFORMANCE SPECIFICATIONS**

1. Maximum Temperature Rating: 1,150° C
2. Normal Operating Temperature: 200-1,050° C
3. Cross-Belt Temperature Uniformity:  $\pm 2^{\circ}\text{C}$  typical
4. Protections: over temperature, low gas pressure and over load.
5. Cooling Modules: Water cooling is a standard method for the graduated cooling module. Uses facility water at 30LPM/2-4 BAR. Air cooling may be specified at no additional charge.
6. Atmosphere System: 8 independently adjustable gas inlets for uniform flow distribution across entire chamber width.
7. Clearance above Conveyor Belt: 100mm (4 in)
8. Belt width: 125mm (5 in)
9. Belt Speed Range: 25-125mm per minute
10. Drive System: variable frequency control, digital speed display.



11. Exhaust System: 2" diameter air powered venturi exhauster. Full chamber width exhausting. Removable condensate collection trap. Exhaust flow adjust by amplified gas.

#### **FURNACE LAYOUT**

1. Entrance with N2 curtain, and baffle door assembly	600mm (24 in)
2. Zone 1	400mm (16 in)
3. Zone 2	400 mm (16in)
4. Zone 3	400 mm (16 in)
5. Zone 4	400 mm (16 in)
6. Zone 5	400 mm (16 in)
7. Zone 6	400 mm (16 in)
8. Insulated cooling	900 mm (36 in)
9. Graduated water cooling module, including N2 Curtain & Baffle assembly	1,700mm (68 in)

#### **TABLES**

1. Loading table is 600mm long and 900mm high
2. Un-loading table is 600mm long and 900mm high
3. Tables are stainless steel.
4. Entrance table has three thermocouple ports. Thermocouple ports connect to the microprocessor, so that profiling thermocouples can be connected and used with the Windows based DSC system to capture, display, store, and print profiles (if DCS control is selected).

#### **APPROXIMATE LENGTH OF FURNACE**

7,000mm

#### **CONVEYOR SYSTEM**

1. Belt material Nichrome V mesh
2. Belt Mesh: Balanced Spiral
3. Belt Speed: 25~125mm (1-5 in)/min. Belt speed is programmable in IPM with readout on the PC. Deviation from set point alarm is programmable. Range of speeds specified refers to adjustability of belt speed only, and does not imply compliance with load and temperature requirements over the range of belt speed adjustability. An alarm will alert stoppage of conveyor belt.
4. Speed Control: variable frequency motor controller, digital displayed

#### **TEMPERATURE CONTROLS**

1. Microprocessor controls furnace.
2. Zones 1-6 are controlled with 6 single loop intelligent temperature controllers. The controller is a high performance, single ASIC with full auto-tuning PID.
3. Each furnace zone is monitored and controlled using a type "K" thermocouple in the center of each heated zone.

#### **OVERTEMPERATURE PROTECTION**

The furnace is equipped with a redundant overheat safety protection system which incorporates an additional type "K" thermocouple in the center of each controlled zone and a multi-loop alarm.



### **ATMOSPHERE CONTROL SYSTEM**

1. Hengli's atmosphere control system is included for operating in Nitrogen or Hydrogen atmospheres. Six routes of flowmeters are provided as follows:
  - 1 – Entrance curtains (N2)
  - 1 – Exit air curtains (N2)
  - 1 – Entrance curtains (N2)
  - 1 – Exit air curtains (N2)
  - 2 – Exhaust gas (N2)
  - 2 – Process gas (H2)
  - 2 – Process gas (N2)
2. The PC can silence low pressure alarms.
3. Gas sample ports are located (optional)
  - 3 – Preheating, high temp and cooling
  - 1 – Incoming supply
4. The gas ports are capped internally to the furnace frame for easy connection to optional atmosphere analyzing.
5. The adjustable range is from 0 to 70 liters per minute.
6. Furnace can be used with air, nitrogen, or hydrogen in nitrogen forming gas. Designed for high-rate hydrogen application.
7. Burnout atmosphere is fed into the furnace at the end of zone 1. Firing section atmosphere is fed into the furnace at the cooling section.

### **ELECTRICAL SPECIFICATION**

1. Connected Load is 36KW.
2. Operating from 220V, 3 phase power transformer, with 3-wire, 50-60 Hz.

### **UPS**

1. UPS is available as an option.
2. Emergency off buttons are located at each end of furnace connected to 24V emergency off circuit.

### **PHYSICAL CHARACTERISTICS**

1. Off-white color.
2. Approximate weight is 2,000kg.

### **MANUALS**

Instruction, operations, and maintenance manuals are included.

### **PROTECTIONS**

Over temperature, low gas pressure, and over load.