

High Temperature Convection Oven Specifications

1. OVEN REQUIREMENTS:

- a) Shall have a minimum temperature range of 15°C above ambient to 704°C.
- b) Shall have the following empty chamber performance with exhaust closed and at rated voltage: uniformity of $\pm 2\%$ of setpoint, control accuracy of $\pm 0.5^\circ\text{C}$, resolution of $\pm 0.1^\circ\text{C}$.
- c) Shall have minimum interior dimensions W x D x H (inches) of 48 x 24 x 36.
- d) Shall have a minimum interior space of 24 cubic feet.
- e) Shall have a three (3) inch diameter access port with cover centered on rear oven wall.
- f) Shall have a thermocouple jack panel for four (4) type J thermocouples located within the oven workspace.
- g) Shall have a temperature control system based on part thermocouples.
- h) Shall have a single door.
- i) Shall have a minimum warranty of at least 1 year on labor and parts.
- j) Shall have electrical power requirements of 460V/480V 3 Phase 60 Hz, Amp Draw of 41 and KW of 30.0 kW

2. INTERIOR CABINET CONSTRUCTION:

- a) Shall be all-welded heavy gauge welded and sealed, reinforced type 304 stainless steel and all seams and entrance ports shall be welded gas tight.
- b) Shall have seven (7) shelf positions on 4" centers with the first shelf position starting at 4 inches from the inner chamber floor.
- c) Shall include three (3) stainless steel slotted shelves.

3. EXTERIOR CABINET CONSTRUCTION:

- a) Shall be all-welded heavy gauge, reinforced cold-rolled steel finished with a durable textured powder paint finish.
- b) The oven door shall be manufactured of cold-rolled steel exterior and stainless steel interior.
- c) The oven door shall be Heat shielded low skin temperature.

d) The door shall utilize ball-bearing hinges and industrial type latching to provide a positive door seal and minimize fume leakage.

e) A safety door switch shall be installed which turns off power to the blower and heaters whenever the door is opened.

f) The oven shall have 6" of mineral wool insulation to minimize heat loss.

4. CONTROL SYSTEM:

a) Shall be a microprocessor based programmable temperature control system with advanced PID control algorithm. It shall offer adaptive control to provide tight control and provide auto-tune for fast, efficient start up, Ramp and soak control with two (2) channels of cascade PID, Ramp and soak programming of up to four (4) profiles with 40 total steps. It shall include EtherNet/ IP/ Modbus TCP and Standard Bus 485 communications and appropriate software.

b) The control system shall control by conditioning air temperature, by control at the part/product. The controller shall raise the air temperature (with preset limits) to above set point, driving the product toward desired temperature. As the product approaches set point, the air temperature shall drop to provide near zero product temperature overshoot. Cascade control shall be provided. Load control thermocouples shall be provided.

c) Software shall be provided that allows the operator to configure, control, and log data to and from twenty controllers. The software shall allow the operator to write and store programs (profiles) on a computer and download only the needed program up to twenty controllers. The data acquisition feature shall be able to provide trending charts, bar graphs, and additional graphical displays. Data shall be storable on the computer's drive.

d) Over temperature protection shall be provided by an FM-approved limit control with independent sensor and power contactor.

5. HEATING AND AIR DELIVERY SYSTEM:

a) Shall be an indirect drive ball bearing 2 Hp motor with a balanced stainless-steel multi-bladed blower wheel providing horizontal airflow (air moves from the right to the left).

b) The heating elements shall utilize Nichrome wire strung through high temperature, high dielectric strength refractory disks.

c) An airflow switch shall be provided to shut off the heating elements in the event of a blower system failure. This safety system shall ensure that power is connected with the proper phase rotation.

6. MAINTENANCE KIT:

a) Shall be provided that contains door gasket, thermocouple, solid state relay, fusing and all necessary instructions and documentation.

7. COMPLETE DRAWINGS:

a) Shall be provided, both electrical and mechanical.