

Quad Oven Design Requirements

Oven to be as shown in D040481-02, Quad Vacuum Chamber/Oven, with added details as shown below. Note that the vacuum chamber and related equipment are not part of this task, but are shown to describe the oven's load.

Internal Dimensions (with door closed): 51.4" W x 62.8" H x 78.1" L

Wall Thickness: 4"

4.2" risers under oven body for portable lift wheel clearance

21.4" Door depth, outside

Door on 4 castors, 3.5" dia

Door latches are draw type, non-locking, work load rated

Air bake shelf: expanded metal, flattened mesh, 0.079" thick, Type 304 Stainless Steel, 100 lb distributed load capacity

Ports:

- 2 ea, 3" dia, left sidewall for future access

- 1 ea, 3" dia, left sidewall for measurement pumping

- 1 ea, 7" dia, left sidewall for bakeout pumping

- 1 ea, 3" dia, topwall for calibration gas

- 4 ea, 2" dia, topwall for valve stem access

- 1 ea, 6" dia, topwall for RGA electronics

Support bracket: to support elbow under RGA electronics, mounted to oven wall

Removable Access Panel: 17" x 32", left sidewall

Floor Supports for vacuum chamber: sufficient to carry a minimum of 1000 lb load, each 230 VAC heating elements

300C maximum operating temperature

Forced air blower

Heating elements, blower and controls to be located in ducting on top of oven

Ducting on top of oven to be removable for shipping purposes

Durable, insulating plugs provided to block ports (qty. 6) and to surround through tubes (qty. 4); LIGO will be responsible for boring and splitting, as appropriate

Modes for air flow: Heating by recirculation; Cooldown by external air exchange (note: external air exchange will be with outdoor air, 4⁰ C to 38⁰ C)

Air flow mode (air flow gates) to be controlled by a mechanical lever

Connections to outside air (for air exchange) to be made on right side panel of top ducting

Baffling as required for thermal equilibrium

Operating environment: laboratory, with air temperature held to 22⁰ C , +/- 3⁰ C

Controls: adjustable in 5⁰ C increments, from 50⁰ C to 300⁰ C

Air temperature uniformity, across vacuum chamber and pumping lines: +/- 3⁰ C

Temperature variation with time, at any point within the oven: +/- 3⁰ C

Temperature set point accuracy: +/- 5⁰ C

Heating elements to be sized for a 2 hr minimum warmup time to 300⁰ C for 1150 lb stainless steel chamber with 200 lb stainless steel load

Interior walls may be painted carbon steel, as long as paint will not degrade and flake,
causing particular contamination
RS-232 data interface to be provided with unit, for monitoring oven air temperature

Statement of Work

Quad Oven

In performance of this contract, the Contractor shall be required to:

- Design a Quad Oven per the design requirements shown in the attached file
- Submit the oven drawings to the LIGO Project for approval, within 3 weeks after receipt of purchase order. Note: drawings are purchased under this contract, and become the property of the LIGO Project.
- The LIGO Project will respond within 2 weeks of receipt of drawings
- Fabricate the Quad Oven per the drawings, within 3 months of approval
- Quad Vacuum Chamber will be shipped to your site for integration and oven testing
- Test the Quad Oven to confirm compliance with the requirements
- Ship the Quad Vacuum Chamber and Quad Oven to the LIGO Project at:

Attn: Tom Evans
LIGO Livingston Laboratory
19100 LIGO Lane
Livingston, LA 70754