INERT ATMOSPHERE OVEN INSTRUCTIONS
FOR OVENS OPERATING OVER 750°F

1. At no time can any atmosphere other than an inert gas or air be introduced into this oven. This oven is not equipped to handle exothermic gases, endothermic gases or any flammable gases such as hydrogen. Introduction of any such gases may result in an explosion resulting in damage to equipment, facilities and bodily injury.

2. This oven is not equipped to handle any flammable solvents, vapors or gases. Therefore, this oven cannot be used for a process such as paint baking, varnish baking or curing which results in the release of flammable vapors. Introduction of any such flammable solvents, vapors or gases may result in an explosion resulting in damage to equipment, facilities and bodily injury.

3. Inert gases displace air and create oxygen deficient atmospheres which can cause suffocation. Moreover some inert gases, such as Argon, are heavier than air and can collect in low lying sealed areas creating oxygen deficient pockets within the work place. Use inert atmospheres only in large work areas with good ventilation. Do not breathe in or enter an inert atmosphere piece of equipment until it has been thoroughly purged with air.

4. The atmosphere outlet at the top of the workspace must not be restricted during heat up to relieve internal pressure within the oven. The internal pressure within the oven should not exceed 5 inches water column pressure for any extended time period. The atmosphere outlet should not be connected to an exhaust stack or any sort of exhaust system. If a negative pressure is pulled on the oven, room air will be pulled into the oven and contaminate the inert atmosphere. If it is necessary to exhaust gases coming from the exhaust outlet, install an exhaust stack with a hood over the top of the atmosphere outlet leaving 3 inches of clearance in all directions.

5. The atmosphere outlet can be flipped open to increase atmosphere flow for initial purging of air from the oven (if the optional automatic purge solenoid has been installed, this function is automatic). After the oven is purged, the atmosphere outlet can be flipped closed to minimize consumption of inert atmosphere. To remove most most of Oxygen, it is necessary to purge the oven with four oven volumes of inert gas.

6. Inert atmosphere is automatically introduced and internal oven pressure controlled by the regulators installed in the atmosphere inlet pipe train. Maximum inlet pressure to the pipe train is 60 psi. The regulator between the flow meter and the oven has been factory set to provide approximately 1 inch water column pressure within the oven during processing. If additional pressure is desired, the pressure can be increased by removing the regulator cap and screwing inward on the spring to increase the pressure.

7. The oven includes a flow meter calibrated for air. To correct readings for other gases, multiply flow by factors listed below:

   Argon - 1.378
   Carbon Dioxide - 1.517
   Nitrogen - 0.966

8. The inert atmosphere is contained within the oven by use of a silicone rubber gasket around the perimeter of the oven door. The maximum continuous operating temperature for this gasket is 500°F. In order to prevent this exterior gasket from seeing higher temperatures, an internal fiberglass gasket is provided to block the heat in the workspace from the silicone rubber gasket.

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(Cont'd.)

DO NOT leave the oven door partially open when the interior temperature of the oven exceeds 500°F. If this is done, the silicone rubber gasket will be damaged by the hot air escaping around the doorway. If it is necessary to open the oven door at temperatures above 500°F, open the door fully so that no portion of the silicone rubber gasket has air hotter than 500°F contacting it.

The surface of the oven that the silicone rubber gasket seals against extends forward from the face of the oven so that it receives cooling from room air. This surface may heat above 500°F if the door is opened for extended time periods when the oven has been heated above 500°F. DO NOT close the door until this sealing surface has cooled below 500°F.

In order to prevent oxidation, the oven must be kept sealed until the oven temperature is below the temperature at which the work will oxidize. These temperatures are usually well below 500°F. For this reason, it would be unusual to open the oven door at temperature that would damage the external silicone rubber gasket.

As long as the temperature at the gasket and sealing surface does not exceed 500°F, you will have long life from the door gasket. However, if the silicone rubber gasket or sealing surface exceeds 500°F, the gasket will become brittle, crack and leak.

Once the silicone rubber gasket begins to leak, the heated air from inside the oven will be allowed to force its way out through the inner seal and further damage the silicone rubber gasket. For this reason, it is important to make sure that the external silicone rubber gasket is sealed well at all times.

9. Two means of adjusting the door seal are provided.

    1. The hinge side of the door can be moved in and out relative to the face of the oven. Remove the outer door cover to expose hinge-adjusting bolts. The hinge offset (distance to face of the oven) can be adjusted by loosening or tightening the outside and middle bolts on each hinge. The two remaining bolts should be locked against door and jam nuts set to hold hinge position.

    2. The latch side of the door can be adjusted to bring the leading edge of the door closer to the oven by adjusting the setscrews in the l lever handle. If need be, individual catches can be shimmed.

    The door should be adjusted in the closed position. Since the pressure regulator will keep the pressure constant in the oven (within its capacity to do so), leaks must be identified by squirting soap water around the door edges or by adjusting the door for minimum flow as indicated on the flow meter. The door should be adjusted uniformly around the perimeter gradually so that no sections of the gasket bind and prevent other portions from sealing.

10. Other points of the oven, which can be checked for leaks, would be:

    1. Compression fittings at heaters inside the heater terminal boxes
    2. Compression fittings for thermocouples and air flow switch tubes
    3. Pipe train on atmosphere inlet
    4. Shaft seal
    5. Ruptured airflow switch diaphragm
    6. Defective or leaking regulator