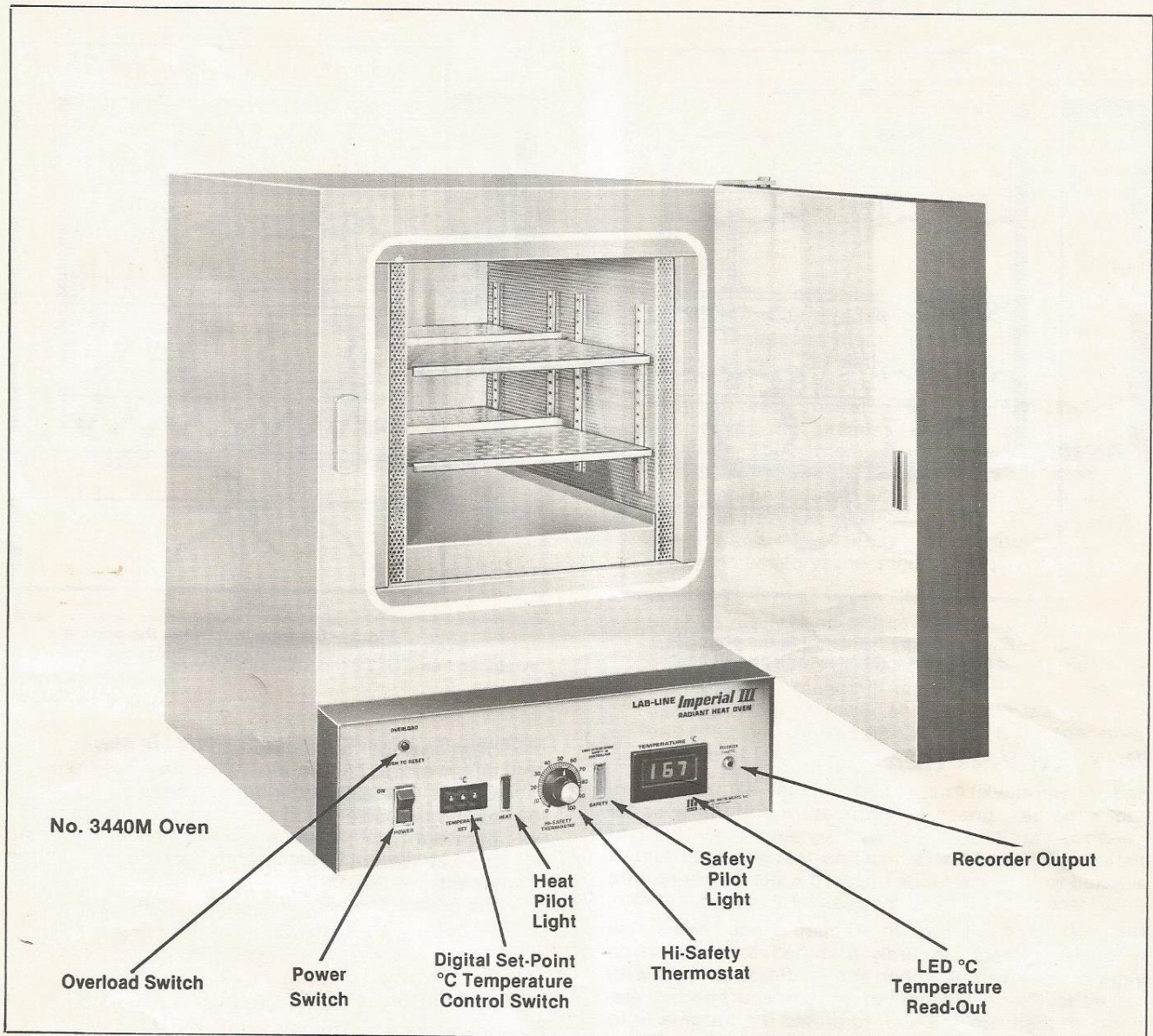


# LAB-LINE® IMPERIAL III RADIANT HEAT OVENS

Wrap-Around Radiant Warm Wall Heat for wall-to-wall and top-to-bottom uniformity



- 3 sizes — six models — aluminum steel interior
- Temperature ranges from slightly above ambient to 270°C
- Control sensitivity down to  $\pm 0.01^\circ\text{C}$
- Temperature uniformity down to  $\pm 1^\circ\text{C}$  at 200°C
- Dual-T-Safety U.L. approved thermostats or solid state calibrated—“Set it and Forget it”—temperature control systems
- Radiant heat or radiant heat with thermo-circulation
- U.L. and C.S.A. approval submitted
- Meets ASTM uniformity specification E145

The Lab-Line® Imperial III Radiant Heat Ovens have given satisfied users the best in design and development of temperature controlled ovens. The Imperial III ovens are without equal for rugged construction for day-in, day-out use, maximum loading capacity with full access to oven chamber, providing uniform radiant heat so vital for attainment of reproducible results, protection of delicate samples and user convenience. These ovens are ideal for heating, aging, preheating, drying, sterilizing, tempering and curing and are especially useful when maximum utilization of oven capacity is required. The Lab-Line® Imperial III Radiant Heat Ovens provide exact control of chamber temperature and durable construction makes them practical for continuous heavy work loads. Wrap-around radiant heat delivers the heat to the sample being processed no matter where its location within the chamber.

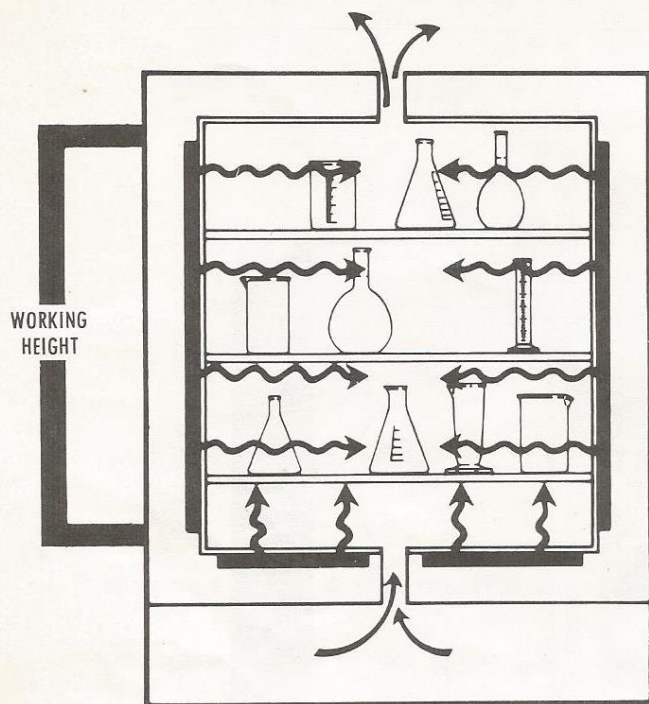


Fig. 1—Diagram illustrates the principle of Lab-Line® exclusive radiant wall heat.

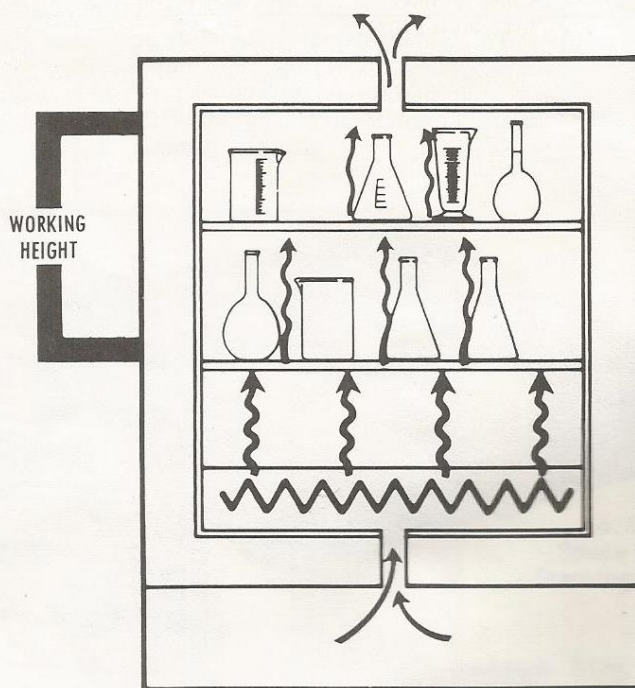


Fig. 2—Diagram illustrates the principle of a conventional gravity convection oven.

### WHY RADIANT HEAT?

Radiant warm wall heating (a Lab-Line® exclusive), produces the best possible temperature uniformity under loaded conditions, unequaled by any other type of heating (Fig. 1). Heat surrounds the workload and is radiated to it. Since radiant heated walls do not require air to transmit their heat, they can heat in all directions.

The Lab-Line® Imperial III Radiant Heat Ovens use sheathed heaters, securely clamped to the outside walls of the oven chamber and in direct contact with the walls. There are no hot or exposed heating elements in the oven chamber to create fire hazards or to reduce the usable work space. Heat is transferred directly from the sheathed heaters to the bottom and side walls of the oven chamber and is radiated uniformly up and across the chamber interior to completely surround the workload, regardless of placement. Temperature uniformity does not fluctuate with load.

Conventional gravity convection ovens (Fig. 2) with inside exposed heaters, have three serious disadvantages:

1. **Inside exposed heaters are a fire hazard.** Spilled liquids or solids can come directly into contact with the heaters.
2. **Inside heaters reduce the working capacity of the oven chamber.** The lowest usable shelf must be placed 3 or 4 inches above the heater plate, reducing working capacity by approximately 25%.
3. **The temperature of a conventional gravity oven is not uniform.** In these ovens, the heaters must operate at a temperature higher than the desired

oven chamber temperature to insure gravity circulation of the heated air. When the lower shelf is loaded, free air circulation is blocked and materials on the lower shelf are heated to a higher temperature than those on the upper shelves. Tests have shown total temperature variations are in the vicinity of 20° to 25°C—the greater the loading, the greater the temperature variation.

### THERMO-CIRCULATION

If temperature uniformity is critical or if rapid drying is required, forced-draft Imperial III Thermo-Circulator Radiant Heat Ovens are recommended (Fig. 3). These ovens are ideal for sample drying, especially when samples are large and moist, moisture-loss determination and dry sterilizing where uniform temperatures and fast drying times are required.

The Lab-Line® Thermo-Circulation system uses a constant speed induction motor driven air circulator to mix heated air with fresh air which is drawn into the oven. This air is then circulated horizontally across the chamber, completely surrounding the work load and withdrawn through the perforated side wall on the opposite side. Vapors picked up from the materials being dried are exhausted through the vent at the top of the chamber. This efficient exchange system assures a minimum loss of tempered air, resulting in better temperature stability and quick recovery after the door has been opened.

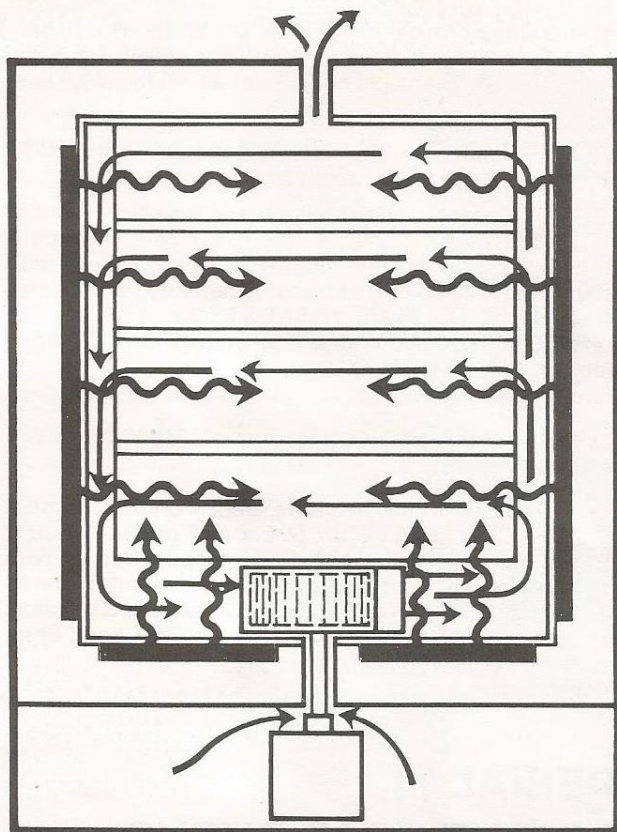


Fig. 3—Diagram illustrates the principle of radiant heat with thermo-circulation—a Lab-Line® exclusive.

## FEATURES

### 1. Two types of temperature control systems available:

**TYPE I. Dual-T-Safety U.L. approved hydraulic thermostats.** A second safety thermostat "backs up" the controlling thermostat. In the event the controlling thermostat should fail, the safety thermostat automatically controls the temperature, preventing damage to irreplaceable specimens as well as protecting the oven from possible damage. Safety indicator signals when safety thermostat is operating. A sensitive thermoregulator senses and controls the set temperature. It is adjustable by means of a reference dial with large, easy-to-read numerals that facilitates reproducible settings. Control sensitivity  $\pm 1^\circ\text{C}$ —main control and safety.

**TYPE II Calibrated "Digital Set" solid state temperature control—"Set it and Forget it" (Pat. Pend).** Calibrated 3-digit temperature set control is accurate to  $\pm 1^\circ\text{C}$ —precision platinum sensor. Proportional control gives fast recovery and low variation. Heat indicator lamp begins flashing when proportioning range is reached. Independent safety thermostat gives protection against failure of main control—safety indicator lamp signals when safety thermostat is operating. Zero crossing control eliminates electromagnetic interferences and all solid state control eliminates contact arcing. Oven is fully protected and isolated from line using U.L. listed 1500

Volt optical isolator to isolate precision control circuits from high current—high voltage thyristors. These ovens also use a low voltage transformer at input and provide a recorder output to record temperature for test records and variation caused by door opening during warm-up, cool-down, etc. Recorder output = 1 MV/°C; accuracy  $\pm 1^\circ\text{C}$ . Platinum sensor on main control, sensitivity  $\pm .01^\circ\text{C}$ , temperature control  $\pm .25^\circ\text{C}$ , and uniformity  $\pm 1^\circ\text{C}$  at  $200^\circ\text{C}$ . Any lab recorder may be used that has a 1 volt full scale sensitivity and greater than 1 MEG OHM input impedance. L.E.D. temperature readout with readout accuracy of  $\pm 1.5^\circ\text{C}$ .

### 2. Heaters

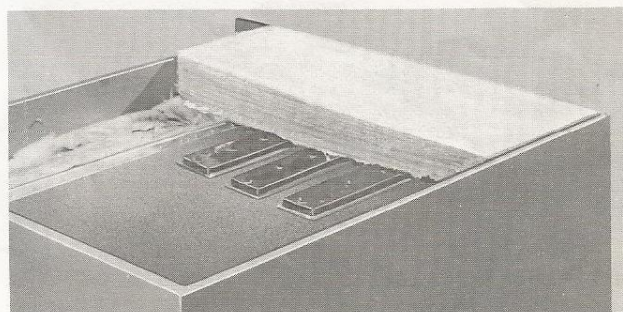
The heaters clamped to the outside of the chamber walls and in direct contact with the walls consist of resistance elements sandwiched between layers of mica insulation and sheathed in aluminized steel. This specially designed heater arrangement for each model gives maximum uniformity and leaves the chamber work space free of obstruction. The heaters are controlled by a two-position switch (hydraulic thermo only) so that voltage input can be reduced when relatively low chamber temperatures are desired. This affords a power savings and minimizes the temperature overshoot at low temperatures (not required on solid state units).

### 3. Shelves

Shelves are formed of heavy gauge perforated aluminum or stainless steel with turned edges on front and back to give added rigidity. Shelves are split-shelves, meaning large glassware can be used on front of lower shelves, still leaving back half of upper shelves free for use. No longer does the use of large glassware eliminate total usage of upper shelves.

### 4. Cabinet

Exterior walls are constructed of all-welded heavy gauge steel, reinforced at all stress points and finished in baked enamel. Easy-to-clean and corrosion resistant oven chambers are formed of heavy gauge solid aluminum and stainless steel. These walls are excellent heat conductors and transmit uniform radiant warm wall heat. A minimum of three inches (7.6 cms) of glass wool insulation between inner and outer walls thoroughly insulate the chamber. Heat is retained within the chamber while the oven is effectively insulated for external temperature fluctuation.



Lab-Line® exclusive Radiant Heaters are clamped to outside of the chamber walls and in direct contact with the walls.

**5. Door**

The sturdy door has the same basic construction and insulation as the cabinet. The two full-swing pivot hinges permit the door to be opened without overhanging the width of the oven, making side-by-side placement possible. A magnetic catch allows the door to close without jarring so that the work load inside is not disturbed. The "Stay-Cool" door handle is recessed, providing a convenient, positive grip. A special silicone gasket resists the effects of heat and solvent vapors while maintaining its resiliency. The gasket is extended to provide an effective door seal.

**HOW TO ORDER**

**NO. 3400 LAB-LINE® IMPERIAL III RADIANT HEAT OVEN (15 month warranty).** Temperature range from slightly above ambient to 270°C; radiant warm wall heat; working chamber 18"D x 13"W x 13"H (45.7 x 33 x 33 cms)— 1.8 cu ft (.05 cu m); ±1°C sensitivity uniformity ±5°C at 200°C; Dual-T-Safety hydraulic thermostats —1 control, 1 safety—safety temperature control ±1°C; 3 perforated aluminum split-shelves with 702 sq in (4529 sq cm) of loading capacity; thermometer; solid aluminum interior; heavy gauge baked enamel steel ex-

terior; 3 wire cord; overall size 25"D x 27-1/2"H x 19-1/8" W (63.3 x 69.9 x 48.6 cms). 120 Volts, 50/60 Hz. 1200 Watts. Net wt. 75 lbs (34 kgs); Ship. wt. 90 lbs (40.8 kgs)  
**Price** .....

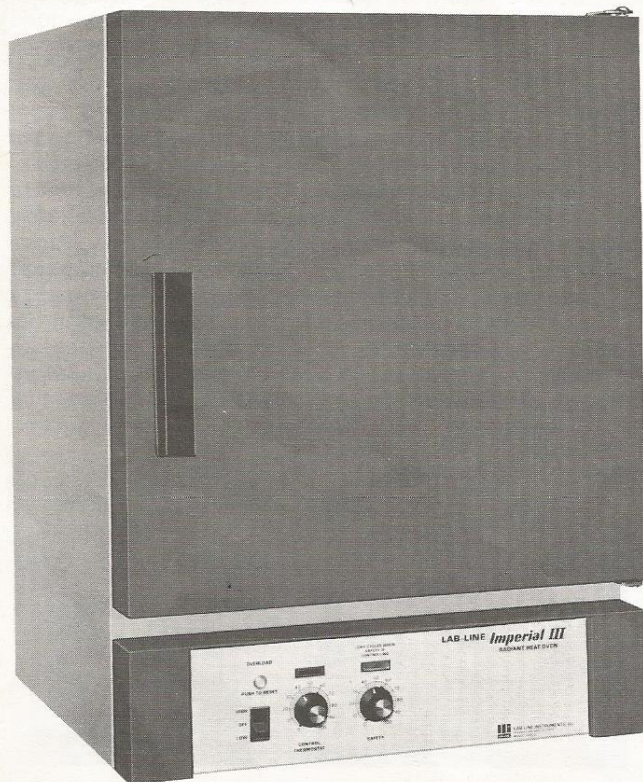
**NO. 3400-1** Same as NO. 3400 except 240 Volts, 50/60 Hz. **Price** .....

**NO. 3405** Same as NO. 3400 except working chamber 20"H x 18"W x 18"D (50.8 x 45.7 x 45.7 cms)—3.8 cu ft (.1 cu m); 4 perforated aluminum split-shelves with 1200 sq in (7742 sq cm) of loading capacity; overall size 34-1/2"H x 25"D x 24-1/8"W (87.6 x 63.3 x 61.3 cms). 120 Volts, 50/60 Hz. 1800 Watts. Net wt. 105 lbs (47.6 kgs); Ship. wt. 130 lbs (59 kgs).  
**Price** .....

**NO. 3405-1** Same as NO. 3405 except 240 Volts, 50/60 Hz. **Price** .....

**NO. 3409-1** Same as NO. 3400 except working chamber 25"W x 20"H x 18"D (63.5 x 50.8 x 45.7 cms)—5.2 cu ft (.15 cu m); 4 perforated aluminum split-shelves with 1800 sq in (11,613 sq cm) of loading capacity; overall size 34-1/2"H x 31-1/8"W x 25"D (87.6 x 79 x 63.3 cms). 240 Volts, 1900 Watts. Net wt. 155 lbs (70.3 kgs); Ship. wt. 210 lbs (95.3 kgs).  
**Price** .....

**LAB-LINE® IMPERIAL III  
THERMO-CIRCULATOR RADIANT HEAT OVENS**



**No. 3435M Oven**

**NO. 3430M LAB-LINE® IMPERIAL III THERMO-CIRCULATOR OVEN (15 month warranty).** Radiant warm wall heat; brushless, induction motor driven blower; working chamber 18"D x 11.5"H x 11"W (45.7 x 29.2 x 27.9 cms) 1.3 cu ft. (.04 cu m) 3 perforated shelves with 594 sq in (3832 sq cm) of loading capacity; thermometer; aluminum interior; heavy gauge baked enamel steel exterior; blower capacity 60 cu ft/min; temperature range from slightly above ambient to 270°C. Dual-T-Hydraulic thermostats 1 control, 1 backup, sensitivity ±1°C, uniformity ±1°C at 200°C; 3 wire cord; overall size 27 1/2"H x 25"D x 19-1/8"W (69.9 x 63.3 x 48.6 cms). 120 Volts 50/60 Hz 1300 Watts. Net wt. 80 lbs (36.7 kgs); Ship. wt. 95 lbs (43.1 kgs). **Price** .....

**NO. 3430M-1** Same as NO. 3430M except 240 Volts. **Price** .....

**NO. 3435M** Same as NO. 3430M except working chamber 18.5"H x 18"D x 16"W (46.9 x 45.7 x 40.6 cms) 3 cu ft (.09 cu m); 4 perforated shelves with 1152 sq in (7432 sq cm) of loading capacity; overall size 34 1/2"H x 25"D x 24-1/8"W (87.6 x 63.3 x 61.3 cms) 120 Volts, 50/60 Hz 1900 Watts. Net wt. 110 lbs (50 kgs); Ship wt. 143 lbs (64.9 kgs). **Price** .....

**NO. 3435M-1** Same as NO. 3435M except 240 Volts. **Price** .....

**NO. 3439M-1** Same as NO. 3430M except working chamber 23"W x 18.5"H x 18"D (58.4 x 46.9 x 45.7 cms) 4.4 cu ft (.12 cu m); 4 perforated shelves with 1656 sq in (10684 sq cm) of loading capacity; overall size 34 1/2"H x 31-1/8"W x 25"D (87.6 x 79 x 63.3 cms). 2000 Watts. Net wt. 165 lbs (74.8 kgs); Ship wt. 220 lbs (99.9 kgs). ONLY AVAILABLE WITH 240 VOLT, 50/60 Hz CONTROL PANELS. **Price** .....