

RAPIDVAP[®]

EVAPORATION SYSTEMS



Protecting your
laboratory environment

LABCONCO

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An Overview

RapidVap Evaporation Systems are multiple-sample evaporators that use a combination of gentle forces — vortex motion and heat with either vacuum or nitrogen (N₂) blow down — to quickly reduce samples to dryness or an end point volume. These two redesigned systems have sleek new styling and added programmability. Up to 9 different protocols may be entered into memory so exact test parameters can be easily repeated.

RapidVap Systems are built to resist attack from strong chemicals. The chamber and sample block are Teflon*-coated and all mechanical components such as bearings are isolated from chemical fumes and vapors. Two distinct RapidVap Systems are offered; to accelerate evaporation, one utilizes vacuum and the other utilizes nitrogen blow down.

The Heat Advantage

Heat helps speed the evaporation process. A precisely controlled dry heating system in direct contact with the sample block supplies heat up to 100° C. Unlike water bath heaters, dry heat requires no maintenance and adds no potential source of contamination. The heater may be used to preheat the block prior to loading samples and/or may be activated during the run to overcome evaporative cooling effects by volatile solvents. The heater orbits with the vortexing block so lower heater temperatures are required.

The Benefits of Vortex Motion

The vortex motion of RapidVap Evaporation Systems optimizes evaporation and recovery of analytes. Each tube moves in a gentle orbital motion. A microprocessor controls the speed of motion desired. This agitation causes the liquid sample in the tube to form a vortex-like configuration which greatly increases the sample's surface area and ability to evaporate. Vortex motion also helps to mix the components in the liquid sample so the end point sample better represents the pre-processed mixture. The vortexing feature allows solvent exchange and/or resuspension procedures to be performed while samples remain in the block, thus saving time and additional glassware handling steps. Finally, as the liquid forms the vortex shape, a centrifugal force is established which forces the liquid outward against the tube walls. This force helps prevent bumping and potential loss of sample so recovery is enhanced.

* Teflon® is a registered trademark of E. I. Dupont.



The gentle agitation of the sample tube causes the liquid to form a vortex-like configuration which increases the sample's surface area and ability to evaporate.



The RapidVap Vacuum Evaporation System uses vacuum, heat and vortex motion to speed evaporation.

RapidVap Vacuum Evaporation Systems

The RapidVap Vacuum Evaporation System is ideal for preparation of samples in a variety of applications including drug discovery, agrichemistry, mycology testing and environmental analysis. The system uses vacuum along with heat and vortex motion to help speed evaporation and provides an alternative to traditional centrifugal evaporation methods. A microprocessor provides precise control of the vacuum level so that bumping can be minimized, preventing loss of sample. A port on the back of the RapidVap Vacuum System allows attachment to an accessory diaphragm or rotary vane vacuum pump.

The RapidVap Vacuum Evaporation System accommodates seven different, interchangeable accessory sample blocks holding sample volumes from just a few milliliters to as large as 450 milliliters. These new blocks hold more samples than ever before, offering greater throughput. As many as 110 each 12 or 13 mm tubes may be loaded at once. Additional blocks accommodate various tube types including conical centrifuge tubes and scintillation vials. Custom blocks to fit special glassware configurations such as VOA vials are also available.

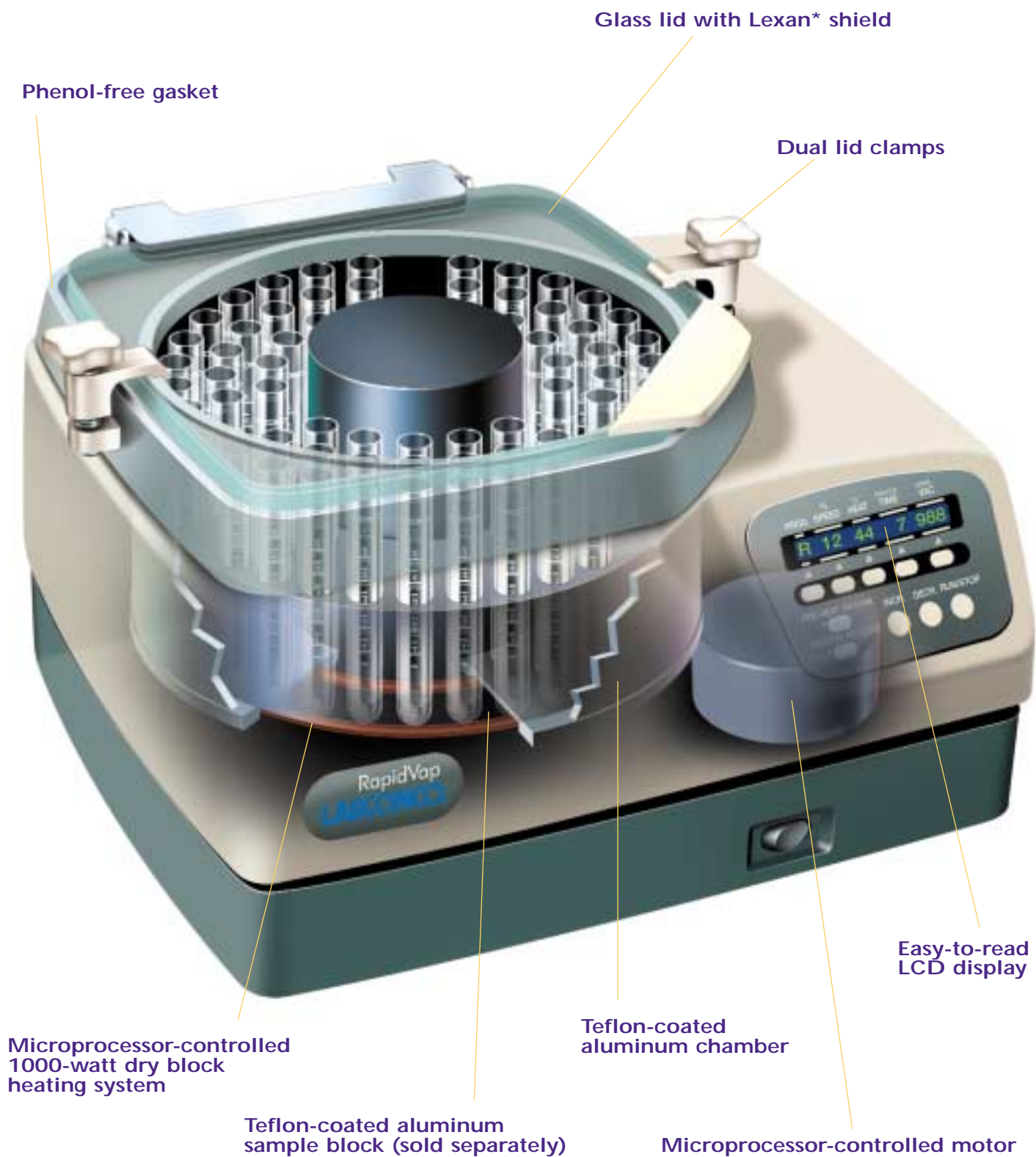
RapidVap N₂ Evaporation Systems

The RapidVap N₂ Evaporation System offers a more efficient, automatic alternative to Kuderna-Danish and rotary evaporators. In the RapidVap N₂ System, a stream of nitrogen or dry gas is directed downward onto the surface of the sample. Nitrogen blow down reduces the partial pressure directly over the liquid to speed evaporation and help remove the solvent as it evaporates. Nitrogen may be programmed for 2, 4, 6 or all 8 tube locations.

The block holds eight large samples, up to 450 milliliters each, making it efficient for environmental and residue testing. An accessory block that holds eight 170 milliliter tubes suitable for solid phase extraction is also available. In many of these applications, the samples should not go to dryness. The unique Cool-Zone™ block and tube design significantly reduces the evaporation rate after end point is achieved. The Cool-Zone insulates the samples and allows the researcher adequate time before the samples reach dryness to remove them or to perform solvent exchange procedures. Alarms that signal when timed end point has occurred and when the RapidVap senses that the process is nearing completion allow for unattended operation.



In the RapidVap N₂ Evaporation System, nitrogen blow down, heat and vortex motion combine to quickly reduce multiple large samples.





Features and Benefits

- ✦ **Faster evaporation rates, greater throughput.**
Vortex action, heat and vacuum combine to accelerate evaporation. Up to 110 samples may be processed at once. See page 6 for evaporation rates. See the back pocket for recovery rates.
- ✦ **Microprocessor-controlled vacuum level speeds evaporation.**
Microprocessor controls vacuum at a preset level. Rear-mounted 1/2" OD port attaches to a vacuum pump (sold separately).
- ✦ **Automatic vacuum release.**
Vacuum is automatically released in the event of power failure.
- ✦ **Microprocessor-controlled 1000-watt dry block heating system.**
Speeds evaporation rate by supplying a controlled amount of heat from ambient up to a maximum of 100° C to the sample block. The heater and block move in tandem for more efficient heat transfer. Unlike water baths, the dry heating system adds no potential source of contamination and requires no maintenance.
- ✦ **Microprocessor-controlled vortex motion increases surface area for faster evaporation.**
Vortex action continually mixes the sample, helps contain analytes in the solvent, minimizes bumping and maximizes sample recovery. It also performs a time-saving function in resuspension and solvent exchange procedures.
- ✦ **Maintenance-free microprocessor-controlled motor.**
Reliable belt-driven system provides smooth variable-speed power to drive the vortex motion up to 1000 rpm. Non-sparking, brushless DC motor ensures safety, control and reproducibility of protocols.
- ✦ **Teflon-coated aluminum chamber.**
Conducts heat efficiently and resists corrosion.
- ✦ **Teflon-coated aluminum sample blocks are interchangeable and hold more tubes than ever before.**
Blocks are sold separately. See page 8. Custom blocks for other tube configurations are also available.
- ✦ **Durable construction with sleek styling.**
The cabinet base is epoxy-coated cast aluminum. The upper housing is solvent-resistant, smooth acrylic/PVC thermoplastic.
- ✦ **Glass lid with Lexan shield.**
Provides visibility of samples, is chemical resistant and detaches for cleaning. Lexan shield provides protection from an unlikely glass implosion.
- ✦ **Dual lid clamps.**
Two clamps hold the lid securely in place for a vacuum tight seal.
- ✦ **Phenol-free gasket.**
Provides complete sealing under vacuum without potential for phenol contamination.
- ✦ **Alarm signals completion of run allowing samples to be left unattended while evaporating to desired end point.**
The RapidVap Vacuum System has two means to signal completion of a run. With the first method, the operator sets the end point time and the audible alarm sounds every 10 seconds when set time has expired. With the second method, the RapidVap monitors system temperature in the block and in the heater. Once the system senses that end point is near, the alarm sounds every 10 seconds and the PREHEAT/END ALARM indicator light flashes. With either method, **the RapidVap Vacuum System continues to process once end point is reached until the operator manually shuts off the system.**
- ✦ **Convenient, easy-to-set programming.**
Parameters of time, heat, vortex speed and vacuum can be easily set with the touch of a few buttons. Up to 9 different user-set programs, each with different parameter set points, may be stored in memory. In addition, the user may alter parameters while a program is in progress.
- ✦ **Easy-to-read LCD display.**
Prompts user to set program parameters and displays program number and actual and set point vortex speeds, temperatures, time remaining and vacuum levels. See details on page 6.
- ✦ **Improved chemical compatibility.**
The operator may use a broad range of aggressive chemicals. Contact a Labconco specialist for specific chemical compatibility.
- ✦ **All mechanical components are isolated from the chemical fumes and vapors for longer life.**
- ✦ **ETL listed.**
The RapidVap Vacuum System carries the ETL Testing Laboratories seal in the U.S. and ETL-C seal in Canada, signifying it meets or exceeds all minimum requirements of UL Standard 3101-1 and CAN/CSA C22.2 No. 1010.1.
- ✦ **International electrical configurations available.**
All 230 volt models conform to the CE (European Community) requirements for electrical safety and electromagnetic compatibility.
- ✦ **Reliability guarantee.**
Full one year warranty is provided against defects in materials and workmanship.
- ✦ **Optional Lid Heater improves visibility.**
A 40-watt heater is securely bonded to the glass lid which electrically connects to the RapidVap via a receptacle on the back of the housing. Heating the lid helps eliminate condensation caused by evaporating high boiling point solvents.
- ✦ **Solvent Recovery System available.**
With the addition of the RapidTrap™ Solvent Recovery System, evaporating solvent can be recovered in a closed system. See the back pocket for RapidTrap information.

✦ Exclusive feature

Control Panel

Program parameter.

LCD shows program from 1 to 9, R for run, or S for stop.

LCD display.

Prompts user to set program parameters and displays program number, actual and set point vortex speed by percentage, actual and set point temperature in °C, time remaining in minutes, and actual and set point vacuum level in mBar.

Vacuum Release button with indicator light.

Pressing the button momentarily breaks the vacuum to control bumping. Vacuum returns to its preset level once the button is released.

Speed parameter.

LCD shows speed from 0 to 100%.

Heat parameter.

LCD shows heat from OFF to 99 (°C) or HI (100° C).

Time parameter.

LCD shows time selected from 1 to 999 minutes. During the run, the LCD shows time remaining. If RUN is selected instead of a time period, the RapidVap runs continuously.

Vacuum parameter.

LCD shows vacuum level from 0 to 999 mBar. Above 999 mBar, the display shows HI and the vacuum pump does not operate.

Set point selection buttons.

To select a parameter to change, press the set point select button directly below the parameter.

Run/Stop button.

Initiates the start or stop of the selected program.

Increase/Decrease buttons.

Used to increase or decrease the last selected set point parameter.



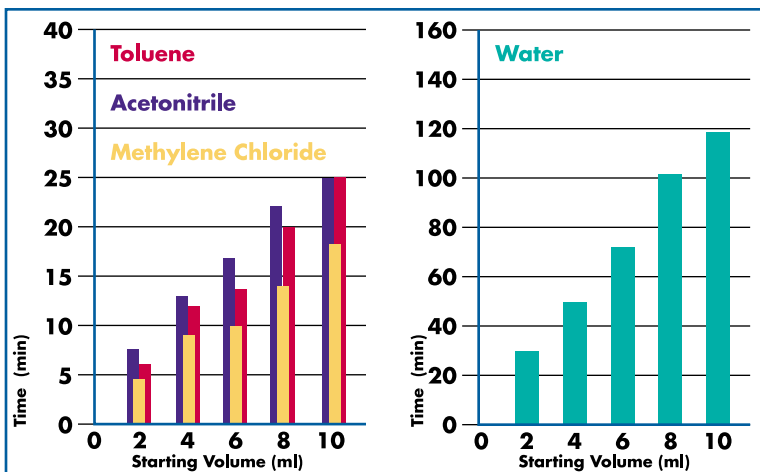
Preheat/End Alarm button with indicator light.

Pressing the button activates the heater to begin elevating the block to set point temperature. When in preheat mode, the operator can monitor actual heat, adding samples and starting program once set point temperature has been reached. During a run, the indicator light flashes when end point has been detected by the temperature sensors. Pressing the button while the light is flashing switches the end point alarm from audible to muted or back to audible.

Evaporation Rates

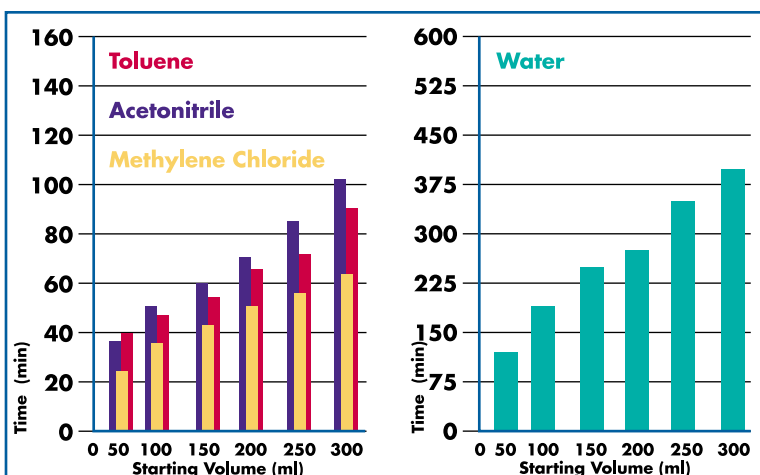
Solvent	Temp.	Vacuum	Overall Evap. Rate
Methylene Chloride	50°C	200 mBar	.56 ml/min./tube
Toluene	80°C	200 mBar	.40 ml/min./tube
Acetonitrile	75°C	330 mBar	.40 ml/min./tube
Water	80°C	133 mBar	.08 ml/min./tube

Number of samples: 69
 Tube diameter: 16 mm
 Block used: 74914-00, 69 tube capacity
 Ending volume: dryness
 Vortex speed: 95%
 Vacuum pump used: 79171-00, 88 liters/minute
 Maximum attainable vacuum: 31 mBar



Solvent	Temp.	Vacuum	Overall Evap. Rate
Methylene Chloride	50°C	250 mBar	4.8 ml/min./tube
Toluene	80°C	133 mBar	3.3 ml/min./tube
Acetonitrile	75°C	167 mBar	2.9 ml/min./tube
Water	80°C	133 mBar	.75 ml/min./tube

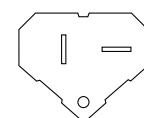
Number of samples: 8
 Tube used: 79092-00,
 600 ml tube, flat bottom, 75 mm diameter
 Block used: 74945-00,
 8 tube capacity
 Ending volume: dryness
 Vortex speed: 28%
 Vacuum pump used: 79171-00, 88 liters/minute
 Maximum attainable vacuum: 31 mBar



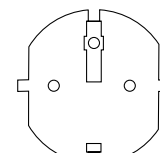


Specifications

- Epoxy-coated aluminum base with acrylic/PVC thermoplastic upper housing.
- Glass lid with Lexan shield.
- Dual lid clamps.
- Phenol-free gasket.
- Teflon-coated aluminum chamber.
- Rear-mounted 1/2" OD vacuum port, 30" of 1/2" ID vacuum tubing, two tubing clamps and lid heater receptacle.
- 1000-watt dry block heating system.
- Microprocessor-controlled programming for vortex speed from 0 to 100%; heat from OFF to 100° C; time from 1 to 999 minutes; vacuum level from 0 to 999 mBar. Memory stores 1 to 9 programs.
- LCD for display of program number and actual and set point vortex speeds, temperatures, time remaining, and point vacuum level.
- Control panel with RUN/STOP button, PREHEAT/END ALARM button and indicator light, VACUUM RELEASE button and indicator light, set point selection buttons, and increase/decrease programming buttons.
- Belt-driven, non-sparking, brushless DC motor with smooth variable-speed power to drive the vortex motion up to 1000 rpm.
- Audible alarm for timed end point.
- Audible/visual alarm for end point detected by temperature sensors at heater and block.
- Automatic vacuum release in the event of power failure.
- All mechanical components isolated from chemical fumes and vapors.
- 115 volt models include 6 1/2 foot, three-wire electrical cord with 20 amp plug. **A 20 amp minimum circuit breaker is required.**
- 230 volt models include 6 1/2 foot, three-wire electrical cord with 15 amp plug. **A 10 amp minimum circuit breaker is required.**
- ETL and ETL-C listing on all 115 volt, 60 Hz models.
- CE mark on all 230 volt, 50 Hz models.
- Overall dimensions with closed lid: 20.7" wide x 18.4" deep x 13.5" high (52.6 x 46.7 x 34.3 cm).
- Overall dimensions with open lid: 20.7" wide x 21.3" deep x 24.9" high (52.6 x 54.1 x 63.2 cm).
- Actual weight 92 lbs. (42 kg)
- Shipping weight 100 lbs. (45 kg)



115 volt,
20 amp plug



230 volt,
15 amp plug

Option

- Glass lid with 40-watt heater.

Accessories required (not included)

- **Vacuum pump.** See page 9.
- **Sample block.** See page 8.
- **Glassware.** See page 8 or contact your laboratory supply dealer.

The RapidVap Vacuum Evaporation System should be located within a fume hood if hazardous or flammable solvents are used. In all cases, regardless of the solvent used, it is recommended that the vacuum pump be vented in a fume hood.

Ordering Information

Catalog Number	Electrical Specifications	Lid Heater
79000-00	115 volts, 50/60 Hz, 7 amps**	
79000-01*	230 volts, 50/60 Hz, 3.5 amps**	
79000-02	115 volts, 50/60 Hz, 8.6 amps**	x
79000-03*	230 volts, 50/60 Hz, 4.3 amps**	x

* International electrical configuration

** Current rating excluding vacuum pump

Accessories



Teflon-Coated Aluminum Blocks

Teflon-Coated Aluminum Blocks

A block is required for all RapidVap Vacuum Evaporation Systems. Blocks are interchangeable. Custom blocks to fit special glassware such as VOA vials are available on request. **Glassware is required (not included).** See below for ordering information on Flat-Bottom Tubes for Blocks 74945-00 and 74864-00. For glassware for all other Blocks, contact your laboratory supply dealer.

Catalog Number	Block Tube Capacity	Sample Tube Size	Sample Volume (ml)	Shipping Weight (lbs./kg)
74913-00	110	12 mm OD tubes, up to 6 ml*	4.5**	8/3.6
74858-00	110	13 mm OD tubes, up to 10 ml*	7.5**	8/3.6
74914-00	69	16 mm OD tubes, up to 23 ml*	17**	7.4/3.4
74963-00	69	15 ml conical centrifuge tubes, up to 15 ml*	11**	7.8/3.5
74964-00	26	28 mm OD scintillation vials, up to 50 ml*	34**	8.3/3.8
74945-00	8	600 ml borosilicate glass tubes	450**	6.4/2.9
74864-00	8	170 ml borosilicate glass tubes	125**	8.2/3.7

*Maximum tube height is 150 mm.

**Actual sample volumes depend on tube shape, height and vortex speed.



600 ml Flat-Bottom Tube
79092-00 and 170 ml
Flat-Bottom Tube 79270-00

Flat-Bottom Tubes

Borosilicate glass tubes offer better fit and heat transfer for faster evaporation rates.

Catalog Number	Sample Tube Size (ml)	Sample Volume (ml)	For Block	Quantity per Package	Shipping Weight
79092-00	600	450	74945-00	1	1 lb. (0.4 kg)
79134-08	600	450	74945-00	8	4 lbs. (1.8 kg)
79270-00	170	125	74864-00	1	1 lb. (0.4 kg)
79271-08	170	125	74864-00	8	4 lbs. (1.8 kg)



Eight-Place Stainless Steel Racks
74876-00 and 74863-00

Eight-Place Stainless Steel Racks

Catalog Number	Holds	Shipping Weight
74876-00	600 ml Tubes	2 lbs. (0.9 kg)
74863-00	170 ml Tubes	2 lbs. (0.9 kg)

Glass Lid with Heater 74865-00

If your application involves water or other high boiling point solvents, a Lid Heater improves visibility and eliminates solvent condensation on the inside of the lid. The glass lid, with 40-watt heater bonded to it, plugs into the electrical receptacle located on the back of the RapidVap. For 115 or 230 volt operation. See page 7 for RapidVap models with built-in lid heater. Shipping weight 6 lbs. (2.7 kg).

Vacuum Pumps

A vacuum pump is required for all RapidVap Vacuum Evaporation Systems.

The best vacuum source for an application depends upon the solvent to be evaporated and the limitations, if any, on the temperature used. For most applications, it is recommended that the vacuum pump has a pumping capacity of 88 liters/minute and achievable vacuum of 29" Hg (31 mBar). Other samples, such as methylene chloride, a low boiling point solvent, can be efficiently concentrated using a vacuum pump with lower vacuum levels. Still other samples, such as heat labile biological samples dissolved in water, a high boiling point solvent, require the high vacuum capability of a rotary vane pump to achieve a good evaporation rate. Two examples of vacuum system set ups are shown at right. Contact Labconco at 800-821-5525 or 816-333-8811 for assistance in selecting the right vacuum pump and accessory traps for your application.





Diaphragm Vacuum Pump
79171-00

Diaphragm Vacuum Pumps

The wetted parts of these pumps are Teflon-coated for corrosion resistance. Vacuum outlet is 1/2" OD. Select pump with an explosion-proof motor if using flammable solvents.

Catalog Number	Electrical Specifications	Vacuum mBar	Pumping Capacity (liters/minute)	Explosion-Proof	Shipping Weight (lbs./kg)
79141-00	115V, 60 Hz, 3.3 amps	206	42	No	12/5.4
79141-01*	220V, 50 Hz, 1.5 amps	206	35	No	12/5.4
79171-00	115V, 60 Hz, 10.8 amps	31	88	No	27/12.2
79171-01*	230V, 50/60 Hz, 4.5 amps	31	73 @ 50 Hz	No	27/12.2
79248-00	115V, 60 Hz, 5.8 amps	206	42	Yes	60/26.2
79248-01*	220V, 50 Hz, 3.1 amps	206	35	Yes	60/26.2
79249-00	115V, 60 Hz, 5.8 amps	31	88	Yes	71/32.2
79249-01*	220V, 50 Hz, 3.1 amps	31	73	Yes	71/32.2
79703-00	115V, 50/60 Hz, 6.6 amps	14	32.5 @ 60 Hz	Yes	68/30.8
79703-01*	230V, 50/60 Hz, 3.3 amps	14	27 @ 50 Hz	Yes	68/30.8

* International electrical configuration



Rotary Vane Direct Drive Vacuum Pump 14721-00

Rotary Vane Direct Drive Vacuum Pumps

These pumps are two-stage, oil-sealed and sliding-vane. The casing is cast aluminum. A one liter bottle of vacuum pump oil and two inlet adapters, 1/2" OD and 3/4" OD, are provided. **A Dry Ice Vacuum Trap is required (see below).**

Catalog Number	Electrical Specifications	Ultimate Vacuum (Partial Pressure) mBar	Pumping Capacity at 60 Hz (liters/minute)	Shipping Weight (lbs./kg)
14721-00	115V, 50/60 Hz, 4.6 amps	2×10^{-3}	117	62/28.1
77394-00*	230V, 50/60 Hz, 2.4 amps	2×10^{-3}	117	65/29.5

* International electrical configuration



Liquid Trap 78734-00

Liquid Traps

Prevent liquid from entering the pump. Made of borosilicate glass. **Required accessory for diaphragm pump when using high boiling point solvents.**

Catalog Number	Trapping Capacity (ml)	Shipping Weight (lbs./kg)
78734-00	2550	4/1.8
79704-00	240	1/0.4

Dry Ice Vacuum Traps

When dry ice and solvent are added to the well, these secondary traps cool to approximately -75° C (-103° F). Inlet and outlet vacuum connections are 1/2" OD. **Required accessory for the rotary vane pump.**

Catalog Number	Dimensions (h x dia.)	Well volume of dry ice and alcohol (liters)	Ice trapping capacity (ml)	Liquid trapping capacity (liters)	Shipping Weight (lbs./kg)
75382-00	9 3/4" x 7 7/8" (24.8 cm x 20 cm)	2.85	900	2	9/4.1
75384-00	7 7/8" x 6 5/8" (20 cm x 16.8 cm)	1.80	200	1	5/2.3



Dry Ice Vacuum Trap 75382-00

Chemical Traps

Connect between the accessory vacuum trap and rotary vane pump to provide additional protection to the pump.

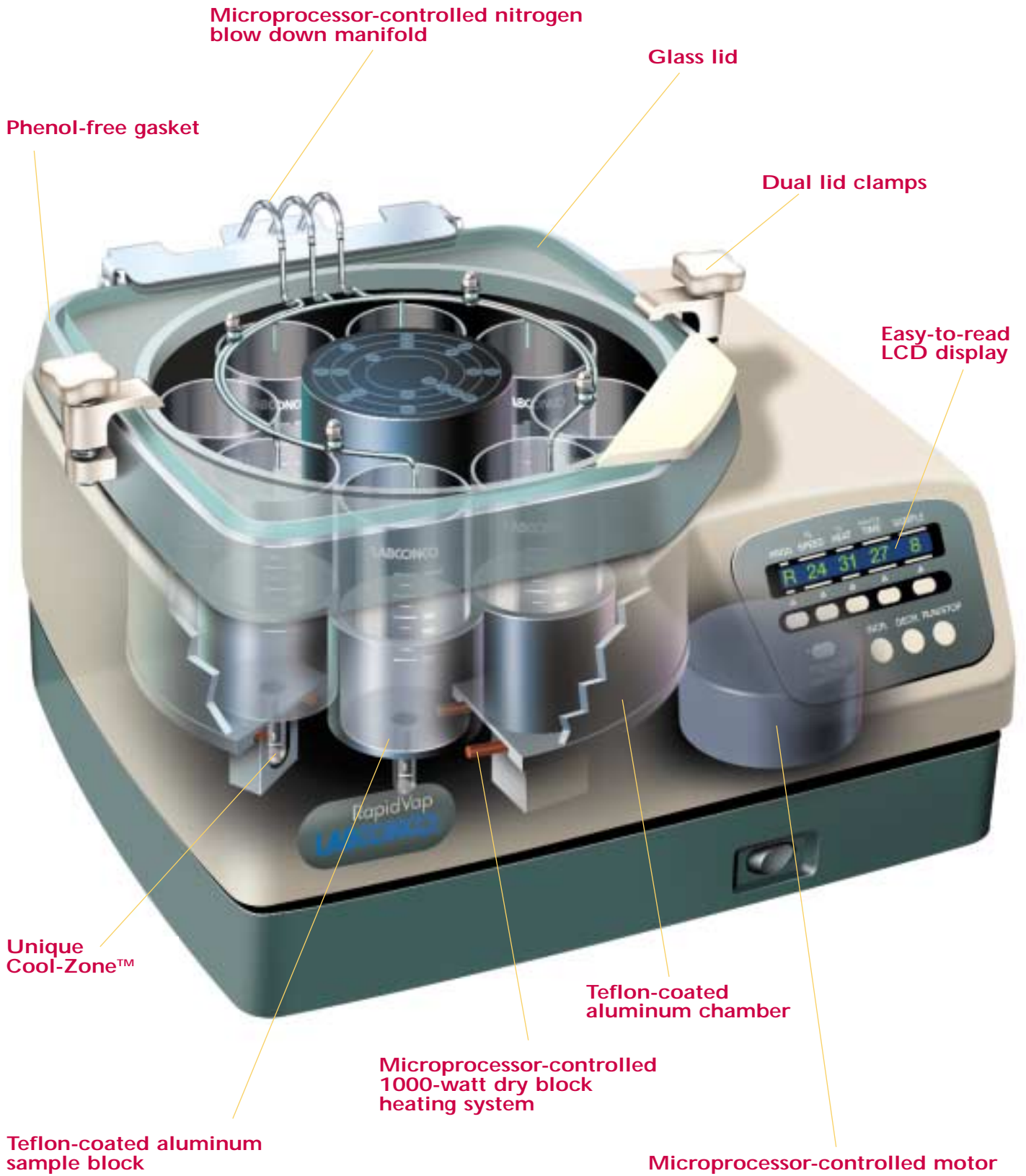
Catalog Number	Trap Insert	Description	Shipping Weight (lbs./kg)
78153-00	Clear Acrylic Canister with stand accommodates any trap insert listed below		5/2.3
78148-00	Acid	Acid neutralizing desiccant	4/1.8
78149-00	Moisture	Desiccant	4/1.8
78150-00	Radioisotope	Molecular sieve	4/1.8
78152-00	Solvent	Activated carbon	4/1.8



Clear Canister 78153-00 with Solvent Trap Insert 78152-00

Vacuum Tubing Kit 78145-00

For use when connecting accessory traps to a vacuum system. Includes two each 1/2" ID vacuum tubing, 48" length, and 4 tubing clamps. Shipping weight 6 lbs. (2.7 kg).





Features and Benefits

Fast evaporation rates, greater throughput.

Vortex action, heat and nitrogen blow down combine to speed evaporation. Eight samples with individual sample volumes up to 450 ml may be processed at once. See page 14 for evaporation rates. See the back pocket for recovery rates.

Microprocessor-controlled nitrogen blow down manifold.

Allows user to introduce nitrogen to 2, 4, 6 or 8 individual sample tubes, conserving nitrogen when less than a full load is being processed. Nitrogen blown onto the surface of the sample helps facilitate the phase change from liquid to gas.

Microprocessor-controlled 1000-watt dry block heating system.

Speeds evaporation rate by supplying a controlled amount of heat from ambient up to a maximum of 100° C to the sample block. The heater and block move in tandem for more efficient heat transfer. Unlike water baths, the dry heating system adds no potential source of contamination and requires no maintenance.

Microprocessor-controlled vortex motion increases surface area for faster evaporation.

Vortex action continually mixes the sample, helps contain analytes in the solvent by constantly rinsing the tube walls, and maximizes sample recovery.

Maintenance-free microprocessor-controlled motor.

Reliable belt-driven system provides smooth variable-speed power to drive the vortex motion up to 500 rpm. Non-sparking, brushless DC motor ensures safety, control and reproducibility for protocols.

Teflon-coated aluminum sample block.

Provides efficient heat transfer, low maintenance and corrosion resistance. Block is easy to remove for cleaning or replacement. One 8-place block that holds 600 ml tubes is included. Optional Block 74864-00 that holds eight 170 ml tubes is available as an accessory.

Teflon-coated aluminum chamber.

Conducts heat efficiently and resists corrosion.

Durable construction with sleek styling.

The cabinet base is epoxy-coated cast aluminum. The upper housing is solvent-resistant, smooth acrylic/PVC thermoplastic.

Glass lid.

Provides visibility of samples, is chemical resistant and detaches for cleaning.

Dual lid clamps.

Two clamps hold the lid securely in place.

Phenol-free gasket.

Provides a positive seal without potential for phenol contamination.

Improved chemical compatibility.

The operator may use a broad range of aggressive chemicals. Contact a Labconco specialist for specific chemical compatibility.

Unique Cool-Zone.

Insulates sample remaining in glassware stem to permit processing to a desired end point. Since the glassware stem does not make direct contact with the heated sample block, evaporation rate is drastically reduced as desired end point is reached, allowing the user ample time to respond to the alarm and remove samples before they reach dryness.

Alarm signals completion of run allowing samples to be left unattended while evaporating to desired end point.

The RapidVap N₂ has two means to signal completion of a run. With the first method, the operator sets the end point time and **when set time has expired an audible alarm sounds and the RapidVap automatically turns off all functions.** With the second method, the RapidVap monitors system temperature in the block and in the heater. During operation, evaporative cooling of the solvent creates a differential between the block and heater temperatures. Once evaporation is nearly complete, the two temperatures equalize indicating end point is near. The alarm sounds and the PREHEAT/END ALARM indicator light flashes.

Convenient, easy-to-set programming.

Parameters of time, heat, vortex speed and number of samples can be easily set with the touch of a few buttons. Up to 9 different user-set programs, each with different parameter set points, may be stored in memory. In addition, the user may alter parameters while a program is in progress.

Easy-to-read LCD display.

Prompts user to set program parameters and displays program number, number of active nitrogen positions, and actual and set point vortex speeds, temperatures, and time remaining. See details on page 12.

All mechanical components are isolated from chemical fumes and vapors for longer life.

Glassware caps prevent contamination.

Caps fit over 600 ml Glass Tubes to prevent contamination and moisture from condensing when low boiling point solvents are used. Eight polyethylene caps are provided.

ETL listed.

The RapidVap N₂ System carries the ETL Testing Laboratories seal in the U.S. and ETL-C seal in Canada, signifying it meets or exceeds all minimum requirements of UL Standard 3101-1 and CAN/CSA C22.2 No. 1010.1.

International electrical configurations available.

All 230 volt models conform to the CE (European Community) requirements for electrical safety and electromagnetic compatibility.

Reliability guarantee.

Full one year warranty is provided against defects in materials and workmanship.

Exclusive feature

Control Panel

Program parameter.

LCD shows program from 1 to 9, R for run or S for stop.

Speed parameter.

LCD shows vortex speed from 0 to 100%.

Heat parameter.

LCD shows heat from OFF to 99 (° C) or HI (100° C).

Time parameter.

LCD shows time selected from 1 to 999 minutes. During the run, the LCD shows time remaining. If RUN is selected instead of a time period, the RapidVap runs continuously.



Sample parameter.

LCD shows number of samples selected to receive nitrogen blow down; 2, 4, 6 or 8 may be selected.

Set point selection buttons.

To select a parameter to change, press the set point select button directly below the parameter.

LCD display.

Prompts user to set program parameters and displays program number, actual and set point vortex speed by percentage, actual and set point temperature in ° C, time remaining in minutes, and number of active nitrogen positions.

Increase/Decrease buttons.

Used to increase or decrease the last selected set point parameter.

Run/Stop button.

Initiates the start or stop of the selected program.

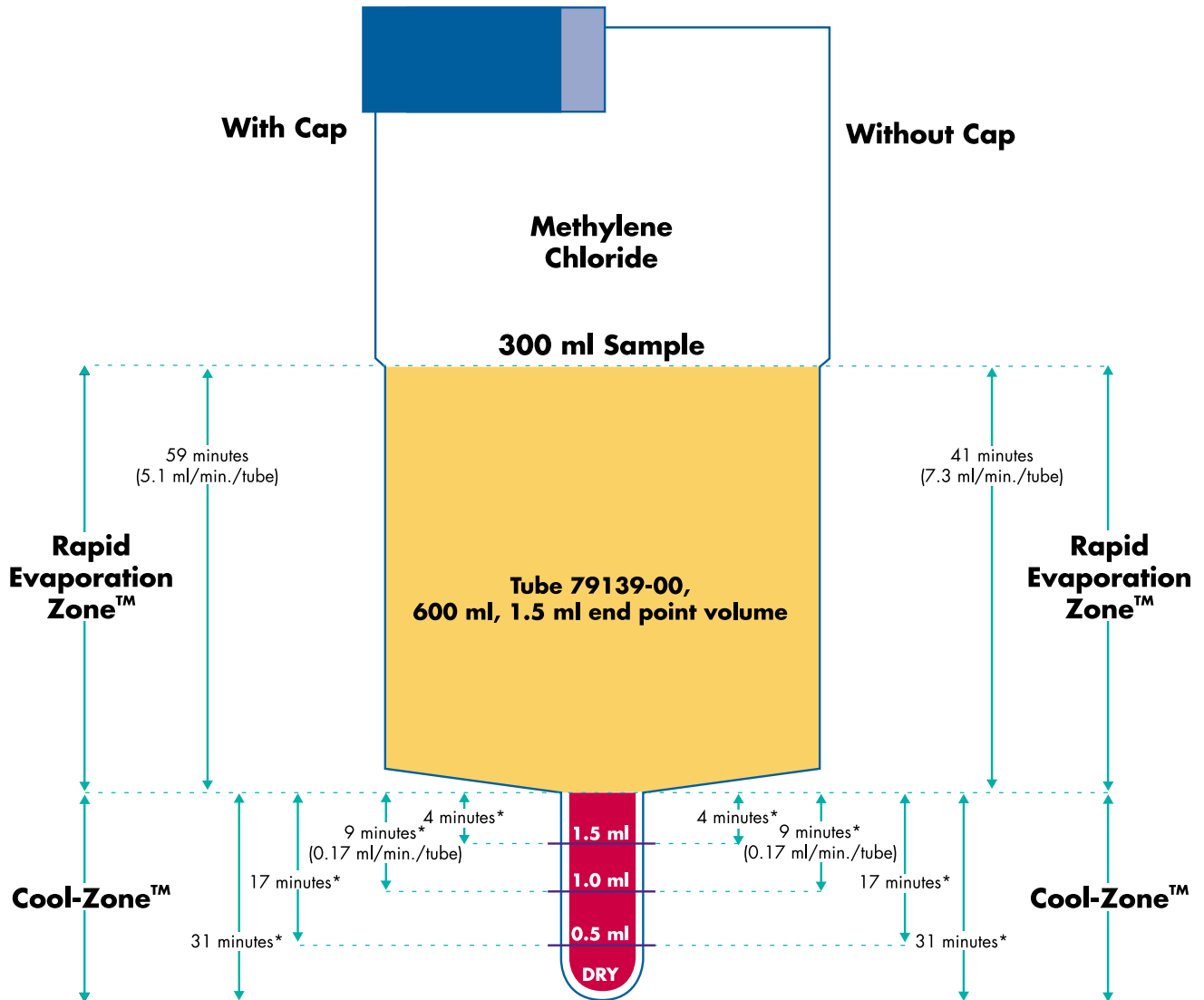
Preheat/End Alarm button with indicator light.

Pressing the button activates the heater to begin elevating to set point temperature. When in preheat mode, the operator can monitor actual heat, adding samples and starting program once set point temperature has been reached. In addition, the indicator light flashes when end point has been detected by the temperature sensors. Pressing the button while the light is flashing switches the end point alarm from audible to muted or back to audible.



Rapid Evaporation Zone™ and Cool-Zone™

This illustration demonstrates the effectiveness of the Rapid Evaporation Zone and the Cool-Zone. In the Rapid Evaporation Zone, a 300 ml sample of methylene chloride is evaporated in 41 minutes at approximately 7.3 ml/minute/tube (without cap). In the Cool-Zone with vortex motion, heat and nitrogen blow down still applied, methylene chloride is evaporated to a 1.0 ml end point in 9 minutes at a much slower rate, approximately 0.11 ml/minute/tube. If the RapidVap is programmed for timed end point, all functions automatically turnoff when time expires drastically slowing the evaporation rate even further. While samples are in the Cool-Zone, the user has ample time to retrieve samples or to perform solvent exchange procedures.



Number of samples: 8
 Nitrogen pressure: 10 psi
 Vortex speed: 70%
 Temperature: 40°C

*Time shown is with nitrogen blow down, vortex motion and heat still applied. Time would be longer if all functions were turned off.



Evaporation Rates



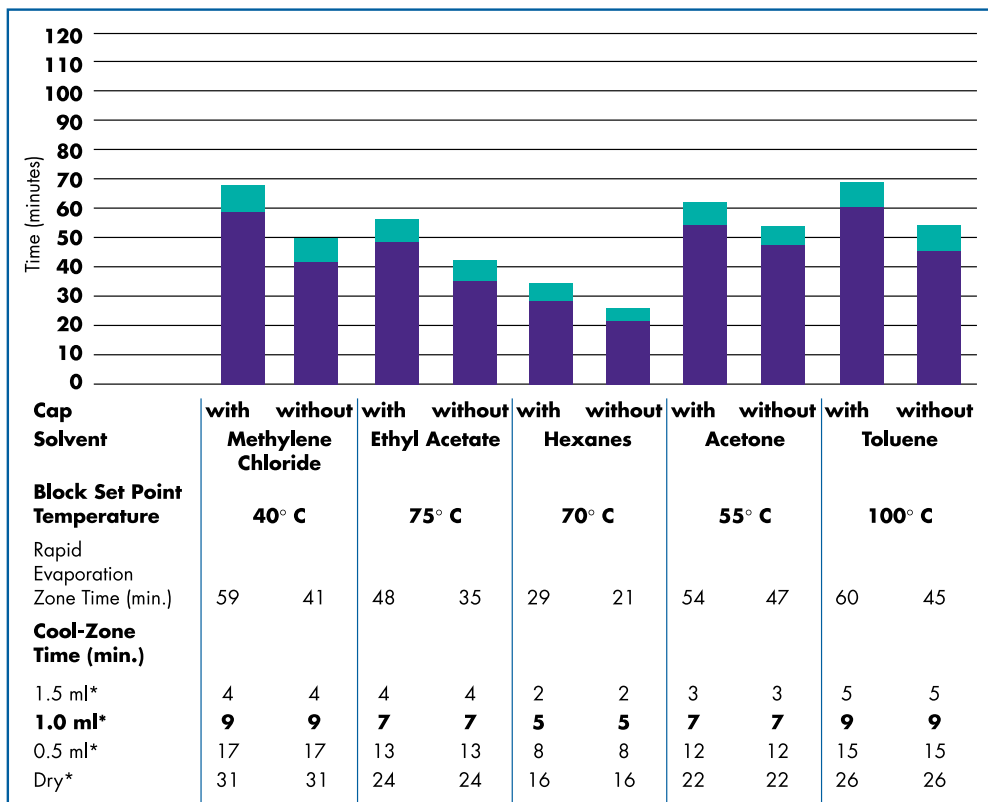
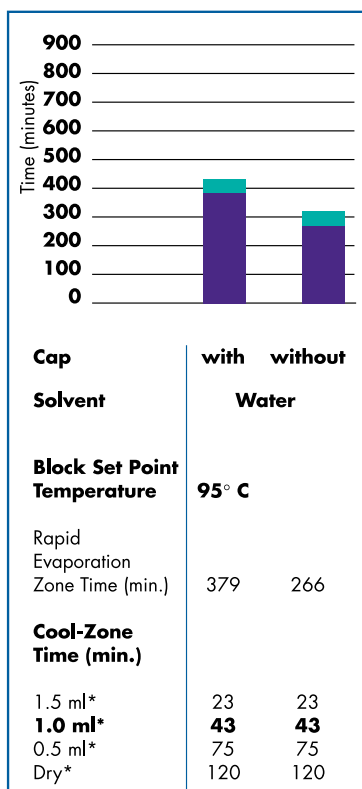
The charts on this page indicate the evaporation times for the Rapid Evaporation Zone and the Cool-Zone. Times were determined with and without Glassware Caps over the sample tubes. Placing Glassware Caps over the sample tubes prevents contamination and prevents moisture from condensing in low boiling point solvents. The use of caps increases overall evaporation time 10 to 80 percent.

RapidVap Evaporation Zone Rate Summary

Solvent	Evaporation Rate with cap	Evaporation Rate without cap
Water	.79 ml/min./tube	1.1 ml/min./tube
Methylene Chloride	5.1 ml/min./tube	7.3 ml/min./tube
Ethyl Acetate	6.3 ml/min./tube	8.6 ml/min./tube
Hexanes	10.3 ml/min./tube	14.3 ml/min./tube
Acetone	5.6 ml/min./tube	6.4 ml/min./tube
Toluene	5.0 ml/min./tube	6.7 ml/min./tube

Number of samples: 8
 Tube used: 79139-00, 600 ml tube with 1.5 ml end point stem, 1.37" (3.5 cm) long
 Starting volume: 300 ml
 Ending volume: 1.0 ml
 Nitrogen pressure: 10 psi
 Vortex speed: 70% of maximum setting

■ Rapid Evaporation Zone
 ■ Cool-Zone



* End point volume



Specifications

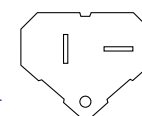
- Epoxy-coated aluminum base with acrylic/PVC thermoplastic upper housing.
- Glass lid.
- Dual lid clamps.
- Phenol-free gasket.
- Teflon-coated aluminum chamber.
- Teflon-coated aluminum sample block capable of holding 8 each 600 ml tubes. Glassware sold separately.
- 1000-watt dry block heating system.
- Microprocessor-controlled programming for vortex speed from 0 to 100%; heat from OFF to 100° C; time from 1 to 999 minutes; and number of active nitrogen positions, 2, 4, 6 or 8. Memory stores 1 to 9 programs.
- LCD for display of program number, actual and set point vortex speed, actual and set point temperature, time remaining, and number of active nitrogen positions.



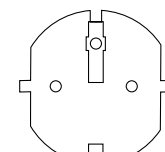
- Control panel with RUN/STOP button, PREHEAT/END ALARM button and indicator light, set point selection buttons, and increase/decrease programming buttons.
- Belt-driven, non-sparking, brushless DC motor with smooth variable-speed power to drive the vortex motion up to 500 rpm.
- Audible alarm with automatic shut down for timed end point.
- Audible/visual alarm for end point detected by temperature sensors at heater and block.
- Nitrogen inlet port supplied with a 1/4" male NPT thread.
- All mechanical components isolated from chemical fumes and vapors.
- Includes 8 polyethylene glassware caps, 6 feet of 2" dia. exhaust tubing, 78" of tubing for nitrogen supply and one tubing clamp.
- 115 volt models include 6 1/2 foot, three-wire electrical cord with 20 amp plug. **A 15 amp minimum circuit breaker is required.**
- 230 volt models include 6 1/2 foot, three-wire electrical cord with 15 amp plug. **An 8 amp minimum circuit breaker is required.**
- ETL and ETL-C listing on all 115 volt, 60 Hz models.
- CE mark on all 230 volt, 50 Hz models.
- Overall dimensions with closed lid: 21.7" wide x 19" deep x 13.5" high (55.1 x 48.3 x 34.3 cm).
- Overall dimensions with open lid: 21.7" wide x 21.3" deep x 24.9" high (55.1 x 54.1 x 63.2 cm).
- Actual weight 99 lbs. (45 kg)
- Shipping weight 107 lbs. (49 kg)

Accessories required (not included)

- **Glassware.** See page 14.
- **Nitrogen with maximum flow rate of 0.6 CFM.** Contact your compressed gas supplier.
- **Gas pressure regulator.** Pressure of 5-10 psi is typical. Pressure must not exceed 15 psi. Contact a local supplier.



115 volt,
20 amp plug



230 volt,
15 amp plug

The RapidVap N₂ Evaporation System should be located within a fume hood if hazardous or flammable solvents are used. In all cases, regardless of the solvent used, it is recommended that the exhaust hose be vented into a fume hood or other laboratory ventilation device.

Ordering Information

Catalog Number	Electrical Specifications
79100-00	115 volts, 50/60 Hz, 9 amps
79100-01*	230 volts, 50/60 Hz, 4.5 amps

* International electrical configuration

Accessories



Teflon-Coated Aluminum Blocks

Teflon-Coated Aluminum Blocks

All RapidVap N₂ Evaporation Systems include an 8-Place Teflon-Coated Aluminum Block 74945-00. Additional Blocks may be purchased for standby use. Or Block 74864-00, which accommodates 170 ml Tubes, may be purchased for solid phase extraction or other applications using smaller sample sizes. Custom blocks to fit special glassware such as VOA vials are available upon request. **Glassware is required (not included).**

Catalog Number Capacity	Block Tube	Sample Tube Size	Sample Volume (ml)	Shipping Weight (lbs./kg)
74945-00	8	600 ml borosilicate glass tubes, up to 600 ml	450 ml*	6.4/2.9
74864-00	8	170 ml borosilicate glass tubes, up to 170 ml	125 ml*	8.2/3.7

* Actual sample volumes depend on tube shape, height and vortex speed.

Borosilicate Glass Tubes

The ground glass tubes offer better fit and heat transfer for faster evaporation rates. The stems are designed for use with Cool-Zone timed end point determinations. To minimize evaporation time, the tube with the correct end point stem should be used. For example, if an end point of 1.5 ml is desired, selecting Tube 79135-00 with a maximum 3.0 ml end point volume would result in an unnecessarily long period required to evaporate the final 1.5 milliliters in the stem. Flat-bottom tubes are for use in applications when samples are taken to dryness. Use the chart below to select the correct tube for your sample volume size and desired end point volume.

Sample Volume	Desired End Point Volume	Tube Recommendations
up to 125 ml	Dryness	79270-00, 79271-08
up to 125 ml	≤1.5 ml	79266-00, 79269-08
up to 450 ml	Dryness	79092-00, 79134-08
up to 450 ml	≤0.5 ml	79259-00, 79260-08
up to 450 ml	0.6-1.5 ml	79139-00, 79140-00
up to 450 ml	1.6-2.0 ml	79137-00, 79138-08
up to 450 ml	2.1-3.0 ml	79135-00, 79136-08



600 ml Tubes with Stems



170 ml Tube with Stem

600 ml Tubes with Stems for Block 74945-00

Each graduated 600 ml tube has a sample capacity of up to 450 ml when vortexing.

Catalog Number	End Point Volume	Calibration Markings	Quantity per Package	Shipping Weight
79259-00	0.5 ml	0.5 ml	1	1 lb. (0.4 kg)
79260-08	0.5 ml	0.5 ml	8	4 lbs. (1.8 kg)
79139-00	1.5 ml	1.5, 1.0 and 0.5 ml	1	1 lb. (0.4 kg)
79140-08	1.5 ml	1.5, 1.0 and 0.5 ml	8	4 lbs. (1.8 kg)
79137-00	2.0 ml	2.0 and 1.0 ml	1	1 lb. (0.4 kg)
79138-08	2.0 ml	2.0 and 1.0 ml	8	4 lbs. (1.8 kg)
79135-00	3.0 ml	3.0, 2.0 and 1.0 ml	1	1 lb. (0.4 kg)
79136-08	3.0 ml	3.0, 2.0 and 1.0 ml	8	4 lbs. (1.8 kg)

170 ml Tubes with Stems for Accessory Block 74864-00

Each graduated 170 ml tube has a sample capacity of up to 125 ml when vortexing.

Catalog Number	End Point Volume	Calibration Markings	Quantity per Package	Shipping Weight
79266-00	1.5 ml	1.5, 1.0 and 0.5 ml	1	1 lb. (0.4 kg)
79269-08	1.5 ml	1.5, 1.0 and 0.5 ml	8	4 lbs. (1.8 kg)



600 ml Flat-Bottom Tube
79092-00 and 170 ml
Flat-Bottom Tube 79270-00

Flat-Bottom Tubes

Borosilicate glass tubes offer better fit and heat transfer for faster evaporation rates.

Catalog Number	Sample Tube Size (ml)	Sample Volume (ml)	For Block	Quantity per Package	Shipping Weight
79092-00	600	450	74945-00	1	1 lb. (0.4 kg)
79134-08	600	450	74945-00	8	4 lbs. (1.8 kg)
79270-00	170	125	74864-00	1	1 lb. (0.4 kg)
79271-08	170	125	74864-00	8	4 lbs. (1.8 kg)



Eight-Place Stainless Steel Racks

Catalog Number	Holds	Shipping Weight
74876-00	600 ml Tubes	2 lbs. (0.9 kg)
74863-00	170 ml Tubes	2 lbs. (0.9 kg)

Eight-Place Stainless Steel Racks
74876-00 and 74863-00



Glassware Cap 79254-08

Glassware Caps

Caps fit over Tubes described on page 16. Placing Caps on Tubes helps prevent cross contamination and moisture from condensing when using low boiling point solvents. Eight Polyethylene Glassware Caps are included with each RapidVap N₂ Evaporation System.

Catalog Number	Material	Description	Quantity per Package	Shipping Weight
79255-00	Polyethylene	Fits 600 ml Tube	1	0.5 lb. (0.2 kg)
79254-08	Teflon	Fits 600 ml Tube	8	0.5 lb. (0.2 kg)
79265-08	Polyethylene	Fits 170 ml Tube	8	0.5 lb. (0.2 kg)
79268-08	Teflon	Fits 170 ml Tube	8	0.5 lb. (0.2 kg)



RapidXtract™ Solid Phase Extraction Manifold 79280-00

The Six-Place Solid Phase Extraction Manifold was designed to be used with 47 mm 3M Empore* Disks, the RapidVap® N₂ Evaporation System, Teflon-Coated Sample Block 74864-00, 170 ml Tubes and a vacuum source. With this combination of products, six samples may be extracted and concentrated in as little as one hour, using 90% less solvent than liquid/liquid extraction. Many EPA methodologies can be utilized to extract a variety of organic compounds including dioxins, pesticides, PCB's and phthalates.

RapidXtract™ Solid Phase
Extraction Manifold 79280-00

Ordering Information

- **Catalog Number 79280-00**
- Stainless steel manifold.
- Six Teflon valves, depending on their position, allow liquid to be drawn through the Empore Extraction Disks or allow the system to be vented.
- Six stainless steel tube holders accommodate 170 ml Tubes for sample elution.
- Six borosilicate glass disk supports.
- Six 300 ml borosilicate glass funnels.
- Six anodized aluminum clamps secure the funnels and filter disk supports together.
- 1/2" stainless steel connector attaches to 38" length of 1/2" ID PVC tubing.
- Dimensions: 28 3/4" wide x 9 3/4" deep x 18 1/2" high (73 x 24.8 x 47 cm)
- Shipping weight 40 lbs. (18 kg)

Required Accessories (not included)

- **Vacuum pump or water aspirator.** See page 9 for ordering information on vacuum pumps.
- **47 mm 3M Empore* Disks.** Contact your laboratory supply dealer or 3M at 800-328-5921.
- **170 ml Tubes.** See page 16 for ordering information.

* Empore™ is a trademark of 3M.

RapidXtract Solid Phase Extraction Procedure

1. **Extraction.** 3M Empore Disks are placed on the Manifold's filter disk supports and conditioned per manufacturer's recommended procedure. A sample as large as one liter is poured into each funnel. The vacuum source (pump or water aspirator) attached to the Manifold creates a suction that pulls the samples through the Empore Disks. Samples are extracted in as little as 10 minutes.

2. **Elution.** Six 170 ml Tubes and optional Drying Columns are added to the manifold. A small amount of solvent is added to each tube location. Adding less solvent results in a more concentrated sample than would be obtained with liquid/liquid extraction, reducing sample prep time. Having the 170 ml Tubes and Drying Columns in the Manifold further reduces sample prep time because elution and drying are combined into one step and transfer of sample from elution tubes to concentration tubes is eliminated.

3. **Concentration.** The 170 ml Tubes are removed from the Manifold and placed in the RapidVap N₂ Evaporation System. The RapidVap N₂ evaporates the solvent in as little as 30 minutes. The RapidVap N₂'s unique Cool-Zone™ prevents the sample from going to dryness, leaving a concentrated sample.

4. **Analysis.** The samples may now be analyzed using an EPA-recommended method.



Accessories for RapidXtract Solid Phase Extraction Manifold



Drying Column 79277-00

Drying Columns

Borosilicate glass Column fits inside the 170 ml Tube and holds Drying Filter 79285-00 (sold separately) or other suitable filtering material. Sodium sulfate or other suitable drying agent is placed on the filter. The sample passes into the drying column, which removes any trace water from the sample. After passing through the drying column and filter, the sample proceeds directly into the 170 ml Tube. Elution and drying are accomplished in one step and transfer of sample to a separate concentration tube is eliminated.

Catalog Number	Quantity per Package	Shipping Weight
79277-00	1	1 lb. (0.4 kg)
79296-00	6	4 lbs. (1.8 kg)



Funnel 79291-00

Drying Filters 79285-00

25 mm diameter. Package of 6. Shipping weight 0.5 (0.2 kg)

Funnels

Made of borosilicate glass with graduated markings. Six 300 ml Funnels are included with the Manifold.

Catalog Number	Size	Quantity per Package	Shipping Weight
79290-00	300 ml	1	0.8 lb. (0.3 kg)
79291-00	1000 ml	1	1 lb. (0.4 kg)
79295-00	1000 ml	6	5 lbs. (2.3 kg)

Replacement Teflon Gaskets 79288-00

Package of 6. Six Gaskets are included with the Manifold. Shipping weight 1 lb. (0.4 kg)



Liquid Trap 79284-00

Liquid Trap 79284-00

Placed between the RapidXtract Solid Phase Extraction Manifold and diaphragm pump to trap waste and to prevent liquid from entering the pump. 11 3/4" high (29.8 cm) x 9 1/8" diameter (23.3 cm) with 1/2" OD vacuum connections. Liquid trapping capacity is 9 liters. Chamber is stainless steel and has a 1/2" thick acrylic lid with rubber gasket. Includes 3 feet of 1/2" vacuum tubing. Shipping weight 20 lbs. (9 kg)



Contact Labconco at 800-821-5525 or 816-333-8811 for more information on these American-made evaporation products.

Rotary Evaporators

Choose from Digital Rotary Evaporators with four different condenser configurations: Diagonal, Vertical, Dewar and Reflux. A Micro Rotary Evaporator with evaporating and receiving flasks of 50, 100 and 250 milliliters has a dual condenser for standard or reflux distillation.



CentriVap® Centrifugal Concentrators and Cold Traps

CentriVap Concentrators in benchtop and mobile designs use centrifugal force, heat and vacuum to rapidly concentrate multiple small-volume biological samples. The CentriVap Cold Trap uses CFC-free refrigeration to trap moisture and solvents to protect the vacuum pump.



FreeZone® Freeze Dry Systems

FreeZone Freeze Dry Systems lyophilize samples to dryness while preserving the product's biological and chemical structure and activities. With applications in biochemical and pharmaceutical research laboratories, CFC-free FreeZone Systems are available in 4.5, 6, 12 and 18 liter collector capacities. A broad range of accessories are offered including Shell Freezers, Stopping Tray Dryers, Drying Chambers, Manifolds and glassware.



Contact Labconco at 1-800-821-5525 or 1-816-333-8811 for information about these quality products for your laboratory.



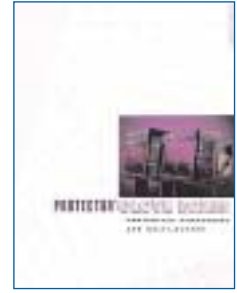
Fume Hoods and Blowers



Carbon-Filtered Enclosures



HEPA-Filtered Safety Cabinets, Enclosures and Clean Benches



Glove Boxes



Histology/Pathology Work Stations



Water Purification Systems



Glassware Washers



Freeze Dry Systems



Centrifugal Concentrators and Cold Traps



Rotary Evaporators



Agricultural Chemistry Products



Laboratory Carts and Benches



Vacuum Desiccator



Blood Drawing Chairs



Digital Chloridometers



Electrophoresis Products

RAPIDVAP® VACUUM & N₂ EVAPORATION SYSTEMS WITH RS-232 LINK



RapidVap N₂ Evaporation System with RS-232 Link 79100-10. Computer and software are not included.

RapidVap Evaporation Systems with RS-232 Link allow you to perform all front panel functions from a user-supplied personal computer. Functions which may be remotely controlled include preheat, vortex speed, temperature, time, vacuum (on RapidVap Vacuum models) and number of active nitrogen positions (on RapidVap N₂ models). The link is two-way so that the RapidVap may be controlled externally (incoming commands) as well as provide status information for monitoring and recording parameters (outgoing status). Communications are in standard ASCII format that is compatible with most user-supplied software programs.

Specifications for All Models

- Rear-located RS-232 port for 2-way communication at 4800 baud, no parity, 8 bit word, 1 stop bit and 3-wire interface.
- Epoxy-coated aluminum base with acrylic/PVC thermoplastic upper housing.
- Glass lid with dual lid clamps and phenol-free gasket.
- Teflon®-coated aluminum chamber.
- 1000-watt dry block heating system.
- Microprocessor-controlled programming for vortex speed from 0 to 100%; heat from OFF to 100° C; time from 1 to 999 minutes. Memory stores 1 to 9 programs.
- LCD for display of program number, actual and set point vortex speed, actual and set point temperature and time remaining.
- Control panel with RUN/STOP button, PREHEAT/END ALARM button and indicator light, set point selection buttons, and increase/decrease programming buttons.
- Belt-driven, non-sparking, brushless DC motor with smooth variable-speed power to drive the vortex motion.
- Audible alarm for timed end point.
- Audible/visual alarm for end point detected by temperature sensors at heater and block.
- All mechanical components isolated from chemical fumes and vapors.
- ETL and ETL-C listing on all 115 volt, 60 Hz models.
- CE mark on all 230 volt, 50 Hz models.

Specifications Unique to RapidVap® Vacuum Evaporation Systems

- Lexan** shield on glass lid.
- Microprocessor-controlled programming for vacuum level from 0 to 999 mBar.
- VACUUM RELEASE button and indicator light,
- Vortex motion up to 1000 rpm.
- LCD for display of vacuum level from 0 to 999 mBar.
- Automatic vacuum release in the event of power failure.
- Rear-mounted 1/2" OD vacuum port, 30" of 1/2" ID vacuum tubing, two tubing clamps and lid heater receptacle.
- 115 volt models include 6 1/2 foot, three-wire electrical cord with 20 amp plug. **A 20 amp minimum circuit breaker is required.**
- 230 volt models include 6 1/2 foot, three-wire electrical cord with 15 amp plug. **A 10 amp minimum circuit breaker is required.**
- Overall dimensions with closed lid: 20.7" wide x 18.4" deep x 13.5" high (52.6 x 46.7 x 34.3 cm).
- Overall dimensions with open lid: 20.7" wide x 21.3" deep x 24.9" high (52.6 x 54.1 x 63.2 cm).
- Actual weight 92 lbs. (42 kg)
- Shipping weight 100 lbs. (45 kg)

Specifications Unique to RapidVap® N₂ Evaporation Systems

- Teflon-coated aluminum sample block capable of holding 8 each 600 ml tubes. Glassware sold separately.
- Microprocessor-controlled programming for number of active nitrogen positions, 2, 4, 6 or 8.
- Vortex motion up to 500 rpm.
- LCD for display of number of active nitrogen positions.
- Automatic shut down when timed end point is reached.
- Nitrogen inlet port supplied with a 1/4" male NPT thread.
- Includes 8 polyethylene glassware caps, 6 feet of 2" dia. exhaust tubing, 78" of tubing for nitrogen supply and one tubing clamp.
- 115 volt models include 6 1/2 foot, three-wire electrical cord with 20 amp plug. **A 15 amp minimum circuit breaker is required.**
- 230 volt models include 6 1/2 foot, three-wire electrical cord with 15 amp plug. **An 8 amp minimum circuit breaker is required.**
- Overall dimensions with closed lid: 21.7" wide x 19" deep x 13.5" high (55.1 x 48.3 x 34.3 cm).
- Overall dimensions with open lid: 21.7" wide x 21.3" deep x 24.9" high (55.1 x 54.1 x 63.2 cm).
- Actual weight 99 lbs. (45 kg)
- Shipping weight 107 lbs. (49 kg)

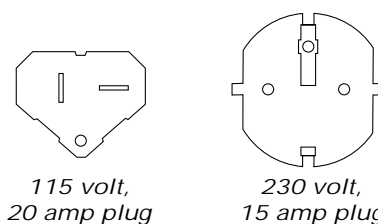
Ordering Information

RapidVap® Vacuum Evaporation Systems with RS-232 Link

Catalog Number	Electrical Specifications	40-Watt Lid Heater
79000-10	115 volts, 50/60 Hz, 7 amps ^{††}	
79000-11[†]	230 volts, 50/60 Hz, 3.5 amps ^{††}	
79000-12	115 volts, 50/60 Hz, 8.6 amps ^{††}	x
79000-13[†]	230 volts, 50/60 Hz, 4.3 amps ^{††}	x

RapidVap® N₂ Evaporation Systems with RS-232 Link

Catalog Number	Electrical Specifications
79100-10	115 volts, 50/60 Hz, 9 amps
79100-11[†]	230 volts, 50/60 Hz, 4.5 amps



The RapidVap Evaporation System should be located within a fume hood if hazardous or flammable solvents are used. In all cases, regardless of the solvent used, it is recommended that the vacuum pump (on Vacuum models) or exhaust hose (on N₂ models) be vented into a fume hood or other laboratory ventilation device.

* Teflon® is a registered trademark of E. I. Dupont.

** Lexan® is a registered trademark of General Electric Company.

[†] International electrical configuration

^{††} Current rating excluding vacuum pump

RAPIDVAP® VACUUM EVAPORATION SYSTEM RECOVERY DATA

Test results show that the RapidVap Vacuum Evaporation System produces excellent recoveries of a wide range of compounds.

Procedure: Samples consisting of a combination of several of the compounds listed below were prepared and each of the resulting compound mixtures was added to a separate 600 milliliter flat-bottom sample tube and placed in Sample Block 74945-00 in the RapidVap 79000-00. The following parameters were set: heat at 50° C, vortex speed at 28% of maximum, and vacuum of 250 mBar. The RapidVap was allowed to run continuously until the sample volume was reduced to 1 ml. A mass spectrometer was used to compare original compound amounts to the amounts detected in the reduced sample. Duplicates of the compound mixtures were tested and the percentages averaged.

BNAs

Compound	% Recovery
Acenaphthene	79
Acenaphthylene	80
Aniline	64
Anthracene	86
Azobenzene	84
Benzo(a)anthracene	82
Benzo(a)Pyrene	85
Benzo(b)Fluoranthene	84
Benzo(g,h,i)perylene	86
Benzo(k)Fluoranthene	87
Benzoic Acid	70
Benzyl Alcohol	73
Bis(2-Chloroethoxy) Methane	75
Bis(2-Chloroethyl) Ether	67
Bis(2-Chloroisopropyl) Ether	67
Bis(2-ethylhexyl)Phthalate	88
4-Bromophenyl Phenyl Ether	76
Butyl Benzyl Phthalate	85
4-Chloro-3-methylphenol	78
4-Chloroaniline	90
2-Chloronaphthalene	75
2-Chlorophenol	64
4-Chlorophenyl Phenyl Ether	80
Chrysene	86
Dalapon	58
Di-n-butyl Phthalate	86
Di-n-octyl Phthalate	89
Dibenzo(a,h)anthracene	84
Dibenzofuran	82
1,2-Dichlorobenzene	63
1,3-Dichlorobenzene	62
1,4-Dichlorobenzene	62
3,3'-Dichlorobenzidine	86
2,4-Dichlorophenol	72
Diethyl Phthalate	82
2,4-Dimethylphenol	68
Dimethylphthalate	79
4,6-Dinitro-2-methylphenol	81
2,4-Dinitrophenol	70
2,4-Dinitrotoluene	80
2,6-Dinitrotoluene	83
Fluoranthene	85
Fluorene	83
2-Fluorobiphenyl (SURR)	75
2-Fluorophenol (SURR)	46
Hexachlorobenzene	84
Hexachlorobutadiene	67
Hexachlorocyclopentadiene	58
Hexachloroethane	62
Indeno(1,2,3-cd)Pyrene	84
Isophorone	76
(3 & 4)-Methylphenol	73
2-Methylnaphthalene	78
2-Methylphenol	69
n-Nitroso-di-n-propylamine	90
N-Nitrosodimethylamine	63
N-Nitrosodiphenylamine	82
Naphthalene	71
2-Nitroaniline	79
3-Nitroaniline	86
4-Nitroaniline	82

BNAs (continued)

Compound	% Recovery
Nitrobenzene	67
Nitrobenzene-d5 (SURR)	62
2-Nitrophenol	69
4-Nitrophenol	87
p-Terphenyl-d14 (SURR)	84
Pentachlorophenol	71
Phenanthrene	86
Phenol	69
Phenol-d6 (SURR)	64
Pyrene	81
Pyridine	59
1,2,4-Trichlorobenzene	69
2,4,5-Trichlorophenol	75
2,4,6-Tribromophenol (SURR)	74
2,4,6-Trichlorophenol	76

CHLORINATED HERBICIDES (PHENOXYS)

Analyte	% Recovery
Bentazon	95
Chloramben	116
2,4-D	94
2,4-DB	99
Dicamba	100
3,5-Dichlorobenzoic Acid	91
Dichloroprop	89
MCPA	80
MCPP	86
Pentachlorophenol	68
Picloram	106
2,4,5-T	118
2,4,5-TP (Silvex)	92
Tetrachloroterephthalic Acid	90

ORGANOPHOSPHOROUS PESTICIDES

Analyte	% Recovery
Bolstar	85
Chlorpyrifos	83
Coumaphos	90
Demeton, O & S	107
Diazinon	86
Dichlorvos	86
Dimethoate	123
Disulfoton	71
EPN	87
Ethoprosfos	89
Ethoprop	81
Ethyl Parathion	91
Fensulfothion	94
Fenthion	77
Malathion	87
Merphos	84
Methyl Azinphos	92
Methyl Parathion	85
Mevinphos	110

ORGANOPHOSPHOROUS PESTICIDES (continued)

Analyte	% Recovery
Monocrotophos	99
Naled	78
Phorate	75
Ronnel	79
Sulfotepp	82
TEPP	95
Tokuthion	79
Trichloronate	80

SEMIVOLATILE ORGANIC PESTICIDES

Analyte	% Recovery
Aldrin	83
alpha-BHC	88
beta-BHC	100
4,4'-DDD	87
4,4'-DDE	83
4,4'-DDT	93
delta-BHC	96
Dieldrin	83
Endosulfan I	75
Endosulfan II	84
Endosulfan sulfate	93
Endrin	90
Endrin Ketone	96
gamma-BHC (Lindane)	100
Heptachlor	83
Heptachlor epoxide	79
Methoxychlor	97

Testing conducted by
Keystone Laboratories, Inc.
Newton, Iowa

RAPIDVAP® N₂ EVAPORATION SYSTEM RECOVERY DATA

Test results show that the RapidVap N₂ Evaporation System produces excellent recoveries of a wide range of compounds.

Procedure: Samples consisting of a combination of several of the compounds listed below were prepared and each of the resulting compound mixtures was added to a separate 600 milliliter sample tube with 1.5 milliliter stems containing 300 ml methylene chloride and placed in the RapidVap 79100-00. Sample tubes were not capped. The following parameters were set: heat at 40° C, vortex speed at 60% of maximum, and nitrogen pressure of 10 psi. The RapidVap was allowed to run continuously until the sample volumes were reduced to 1 ml. A mass spectrometer was used to compare original compound amounts to the amounts detected in the reduced samples. Duplicates of the compound mixtures were tested and the percentages averaged.

BNAs

Analyte	% Recovery
Acenaphthene	97
Acenaphthylene	92
Aniline	87
Anthracene	91
Azobenzene	83
Benzo(a)anthracene	97
Benzo(a)Pyrene	91
Benzo(b)Fluoranthene	96
Benzo(g,h,i)perylene	82
Benzo(k)Fluoranthene	100
Benzoic Acid	100
Benzyl Alcohol	80
Bis(2-Chloroethoxy) Methane	81
Bis(2-Chloroethyl) Ether	76
Bis(2-Chloroisopropyl) Ether	67
Bis(2-ethylhexyl)Phthalate	93
4-Bromophenyl Phenyl Ether	86
Butyl Benzyl Phthalate	94
4-Chloro-3-methylphenol	91
4-Chloroaniline	99
2-Chloronaphthalene	76
2-Chlorophenol	95
4-Chlorophenyl Phenyl Ether	82
Chrysene	96
Di-n-butyl Phthalate	87
Di-n-octyl Phthalate	90
Dibenzo(a,h)anthracene	92
Dibenzofuran	78
1,2-Dichlorobenzene	78
1,3-Dichlorobenzene	75
1,4-Dichlorobenzene	75
3,3'-Dichlorobenzidine	97
2,4-Dichlorophenol	97
Diethyl Phthalate	85
2,4-Dimethylphenol	100
Dimethylphthalate	80
4,6-Dinitro-2-methylphenol	100
2,4-Dinitrophenol	100
2,4-Dinitrotoluene	82
2,6-Dinitrotoluene	83
Fluoranthene	100
Fluorene	97
2-Fluorobiphenyl (SURRE)	79
2-Fluorophenol (SURRE)	77
Hexachlorobenzene	84
Hexachlorobutadiene	78
Hexachlorocyclopentadiene	73
Hexachloroethane	71
Indeno(1,2,3-cd)Pyrene	86
Isophorone	77
2-Methylnaphthalene	83
(3 & 4)-Methylphenol	100
2-Methylphenol	100
n-Nitroso-di-n-propylamine	73
N-Nitrosodimethylamine	83
N-Nitrosodiphenylamine	85
Naphthalene	94
2-Nitroaniline	85
3-Nitroaniline	92
4-Nitroaniline	95
Nitrobenzene	77
Nitrobenzene-d5 (SURRE)	77

BNAs (continued)

Analyte	% Recovery
2-Nitrophenol	98
4-Nitrophenol	100
p-Terphenyl-d14 (SURRE)	87
Pentachlorophenol	100
Phenanthrene	91
Phenol	95
Phenol-d6 (SURRE)	76
Pyrene	96
Pyridine	6
2,4,6-Tribromophenol (SURRE)	79
2,4,5-Trichlorophenol	94
2,4,6-Trichlorophenol	96

CHLORINATED HERBICIDES (PHENOXYs)

Analyte	% Recovery
Acifluorfen	100
Bentazon	93
Chloramben	46
2,4-D	100
2,4-DB	93
Dicamba	87
3,5-Dichlorobenzoic Acid	83
Dichlorprop	82
4-Nitrophenol	100
MCPA	80
MCPP	78
Pentachlorophenol	82
2,4,5-T	78
2,4,5-TP (Silvex)	85

ORGANOPHOSPHOROUS PESTICIDES

Analyte	% Recovery
Bolstar	89
Chlorpyrifos	86
Coumaphos	98
Demeton, O & S	82
Diazinon	89
Dichlorvos	83
Disulfoton	72
EPN	88
Ethoprop	88
Ethyl Parathion	86
Fensulfothion	100
Fenthion	89
Malathion	92
Merphos	93
Methyl Azinphos	99
Methyl Parathion	84
Mevinphos	88
Monocrotophos	82
Naled	83
Phorate	79
Ronnel	85
TEPP	59
Tokuthion	88
Trichloronate	85

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Heptachlor	84
Heptachlor epoxide	92
Methoxychlor	96

Testing conducted by
Keystone Laboratories, Inc.
Newton, Iowa

RAPIDTRAP™ SOLVENT RECOVERY SYSTEMS



The RapidTrap™ Solvent Recovery System connects to the RapidVap® Vacuum Evaporation System to collect from 85 to 95% of the solvent used in processing. The System traps up to 3 liters of solvent for disposal in an environmentally responsible manner, meeting government regulations. In addition, the RapidTrap Solvent Recovery System may be used with other pieces of equipment that evaporate solvents, such as a centrifugal concentrator, rotary evaporator or gel dryer.



*Protecting your
laboratory environment*

LABCONCO®



FEATURES AND BENEFITS

Vacuum controller. Controls the vacuum level at which sample processing occurs. Microprocessor controlled, the system can be programmed to automatically select the vacuum level. It may also be manually selected.

CFC-free refrigeration system. The 1/2 hp compressor lowers cold trap temperature to -40° C. The environmentally-friendly, CFC-free refrigerant does not harm the ozone layer.

Upright, three liter stainless steel collector. Collects up to three liters of solvent before emptying is required. Upright collector speeds defrost if the trapped solvent is frozen. Hot water may be poured over it, or ice collected may be allowed to melt overnight.

Collector drainage port. Simplifies emptying the collector, speeding clean up.

Mobile cabinet. Mounted on 3-inch diameter hard rubber casters, the glacier white and charcoal epoxy-coated steel cabinet may be moved easily from one work location to another. With an interior shelf to accommodate a diaphragm pump and a work surface to accommodate the RapidVap Vacuum Evaporation System, the RapidTrap provides a completely contained system (diaphragm pump and RapidVap are sold separately).

Ground wire clip. Meets OSHA requirements. The clip attaches to a container while solvents are drained from the port to eliminate risk of static electricity igniting the solvent.

SPECIFICATIONS AND ORDERING INFORMATION

78800-00 RapidTrap Solvent Recovery System.

Cabinet, 29" wide x 23" deep x 36" high (73.7 x 58.4 x 91.4 cm), is glacier white epoxy-coated steel with a charcoal epoxy-coated steel work surface, interior epoxy-coated steel shelf, ground wire clip and four 3-inch diameter hard rubber casters.

Collector is a stainless steel chamber with a stainless steel cover capable of collecting 3 liters of solvent. A valve and drain port are located on the front. Trap refrigeration has a 1/2 hp compressor to cool the collector to -40° C (-40° F).

Instrumentation and controls include a vacuum controller; an LED for display of actual vacuum in mBar, vacuum set point in mbar or time remaining in hours; a touch switch with indicator lights for selection of displayed parameter; increase/decrease programming touch switches; MODE touch switch with indicator lights for selecting an operating mode — manual, automatic high vacuum, automatic low vacuum or calibrate; READY indicator light; RUN/STOP switch with indicator light; and power switch.

Electrical requirements, 115 volts, 60 Hz, 9.2 amps, without accessory vacuum pump. One 115-volt electrical receptacle is

LED. Digitally displays actual vacuum in mbar, vacuum set point in mBar or time remaining in hours. A touch switch selects parameter displayed and an indicator light illuminates next to the parameter selected.

Increase/decrease touch switches. Are used in programming to increase or decrease vacuum set point or time.

MODE touch switch. Selects an operating mode: manual, automatic high vacuum, automatic low vacuum or calibrate. The user selects "calibrate" for the first run which is performed without solvent to provide a baseline for system performance.

READY indicator light. Illuminates when trap reaches operating temperature.

RUN/STOP switch. Starts or stops the pump connected to the RapidTrap Solvent Recovery System and activates the mode selected. An indicator light illuminates when the switch is on.

POWER switch. Starts or stops the refrigeration compressor.

Rear-mounted electrical receptacle and connector.

Allow connection of the diaphragm pump and RapidVap Evaporation System to the RapidTrap System so that the pump can be activated from the RapidVap Evaporation System. (RapidVap Evaporation System and diaphragm pump are sold separately).

located on the rear of the cabinet to connect the vacuum pump. One 115-volt electrical connector is located on the rear of the cabinet for interconnecting the RapidVap Vacuum Evaporation System to the Trap, permitting pump control from the RapidVap. A 8-foot, 3-wire cord and plug is provided. **A diaphragm pump is required for operation.** Shipping weight 300 lbs. (136 kg).

78800-01 RapidTrap Solvent Recovery System.

Specifications are the same as 78000-00 except for the following changes.

Electrical requirements, 230 volts, 50 Hz, 4.2 amps, without accessory vacuum pump. One 230-volt electrical receptacle is located on the rear of the cabinet to connect the vacuum pump. One 230-volt electrical connector is located on the rear of the cabinet for interconnecting the RapidVap Vacuum Evaporation System to the Trap, permitting pump control from the RapidVap. A 8-foot, 3-wire cord is provided. **An electrical plug and diaphragm pump are required for operation.**

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