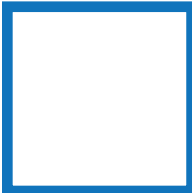


# Proven Tools for Lyophilization



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# SERUM BOTTLES & VIALS

SERUM BOTTLES are ideal for long and short-term sample storage and vaccine/injectable drug containers. These molded borosilicate glass bottles have exceptional wall strength and superior heat and chemical tolerances.

SERUM VIALS are ideal for lyophilization, packaging, and sampling applications. The Pharmaceutical grade glass can withstand the challenges of reduced pressure and extreme temperature variations. Additionally, they will protect against changes in pH and maintain the purity of the contents.

## Serum Bottles

- Borosilicate glass meets USP Type I standards
- Shrink-wrapped partitioned modules reduce breakage

These molded bottles have excellent wall strength and chemical tolerances, which are important for storage applications. Provided in shrink-wrapped partitioned modules with the exception of 2 mL size (no partition).



### Clear Serum Bottles

Catalog Number	Size (mL)	Mouth ID x OD (mm)	Dia x Ht (mm)	Fits Rack	Qty/Case
223712	2	7 x 13	17.5 x 35	868805	288
223738	5	13 x 20	23 x 47	868805	288
223739	10	13 x 20	25 x 54	868806	288
223742	20	13 x 20	32 x 58	868615	288
223743	30	13 x 20	37 x 63	868615	288
223745	50	13 x 20	43 x 73	868615	288
223746	60	13 x 20	41 x 91	868615	144
223747	100	13 x 20	52 x 95	868617	144
223748	125	13 x 20	54 x 107	—	144



### Amber Serum Bottles

Catalog Number	Size (mL)	Mouth ID x OD (mm)	Dia x Ht (mm)	Fits Rack	Qty/Case
223760	5	13 x 20	23 x 47	868805	288
223761	10	13 x 20	25 x 54	868806	288
223762	20	13 x 20	32 x 58	868615	288
223763	30	13 x 20	37 x 63	868615	288
223764	50	13 x 20	43 x 73	868615	288
223766	100	13 x 20	52 x 95	868617	144

## Serum Tubing Vials

- Low extracted borosilicate glass meets ASTM Type I Class A & USP Type I standards
- Shrink-wrapped modules reduce particulate contamination

The blowback feature in the neck and specially designed bottom radius for added strength are important for lyophilization applications. Provided in shrink-wrapped modules (glass to glass) to greatly reduce particulate contamination.



### Clear Tubing Vials

Catalog Number	Size (mL)	Mouth ID x OD (mm)	Dia x Ht (mm)	Fits Rack	Qty/Case
223683	2	7 x 13	15 x 32	868804	144
223684	3	7 x 13	17 x 38	868810	144
223685	5	13 x 20	22 x 40	868805	144
223686	10	13 x 20	24 x 50	—	144
223687	20	13 x 20	30.5 x 58	—	120



### Amber Tubing Vials

Catalog Number	Size (mL)	Mouth ID x OD (mm)	Dia x Ht (mm)	Fits Rack	Qty/Case
223693	2	7 x 13	15 x 32	868804	144
223695	5	13 x 20	22 x 40	868805	144
223696	10	13 x 20	24 x 50	—	144

See page 3 for Lyophilization Stoppers

# CLOSURES

Choosing the correct stopper involves determining the size needed. Stopper diameters should correspond to the mouth ID and OD of the chosen container. Serum bottles and vials typically have a 13mm or 20mm OD.

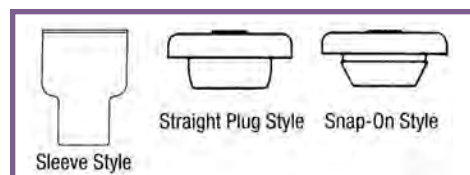
WHEATON SCIENCE PRODUCTS offers the cleanest and most precise pharmaceutical grade stoppers available for research and parenteral drug applications. A variety of sizes and styles are available to suit most applications. 2-leg and 3-leg stoppers are used for lyophilization, and snap-on stoppers are used for sample storage due to their locking abilities when used with serum vials, which contain a blowback neck.



## Stoppers

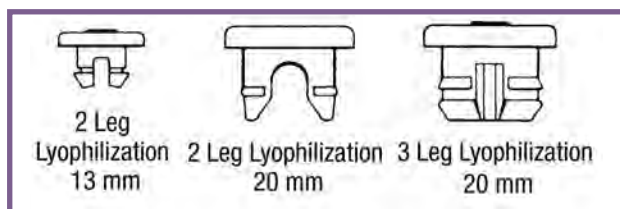
Wheaton Science Products offers the cleanest and most precise pharmaceutical grade rubber stoppers available for research and parenteral drug applications.

- Requirements are met for the pharmaceutical industry
- Production equipment is engineered to yield components with exceptional dimensional stability
- Manufacturing tolerances for flange heights on stock stoppers are routinely held to  $\pm 0.010''$
- A variety of styles and sizes are available
- Manufactured from the highest quality raw materials available
- Rubber formulations include gray butyl, natural rubber, and silicone
- Autoclavable



Sleeve stoppers are plug stoppers with fold-over skirts. This type of stopper is used on serum vials and other crimp-finish containers that do not require aluminum seal or over-cap. Sleeve stoppers can be used as injection sites for multiple dose entry. Manufactured from polyisoprene red rubber, a general-purpose rubber formulation with excellent resealable properties, making it ideal for use in multi-puncture applications.

Catalog Number	For Mouth ID x OD (mm)	Stopper Material	Shelf Pack	Qty/Case
224100-020	5 x 11	Polyisoprene Red Rubber	100	1000
224100-060	7 x 13	Polyisoprene Red Rubber	100	1000
224100-160	10 x 20	Polyisoprene Red Rubber	100	1000
224100-161	13 x 20	Polyisoprene Red Rubber	100	1000
224100-320	15 x 30	Polyisoprene Red Rubber	100	1000



## Lyophilization Stoppers

### 2-Leg

Catalog Number	For Mouth ID x OD (mm)	Stopper Material	Shelf Pack	Qty/Case
224100-092	7 x 13	Gray Chlorobutyl-Isoprene blend/50	100	1000
224100-093	7 x 13	Gray Chlorobutyl/50	100	1000
224100-192	13 x 20	Gray Chlorobutyl-Isoprene blend/50	100	1000
224100-194	13 x 20	Gray Chlorobutyl/50	100	1000
224100-282	20 x 28	Gray Chlorobutyl/50	100	1000

### 3-Leg

The three-legged design provides stability during lyophilization and resists cocking.

Catalog Number	For Mouth ID x OD (mm)	Stopper Material	Shelf Pack	Qty/Case
224100-202	13 x 20	Gray Chlorobutyl/50	100	1000

### Sleeve Style

### Straight Plug Style

Provides maximum sealing for vials with straight-wall glass finish. The straight-wall interior finish is typically found in vials from European manufacturers. Not recommended for vials with a blow-back feature.

Catalog Number	For Mouth ID x OD (mm)	Stopper Material	Shelf Pack	Qty/Case
224100-030	5 x 11	Natural Red Rubber	100	1000
224100-070	7 x 13	Natural Red Rubber	100	1000
224100-072	7 x 13	Gray Chlorobutyl-Isoprene Blend/40 PTFE Faced	100	1000
224100-170	10 x 20	Natural Red Rubber	100	1000
224100-171	13 x 20	Natural Pink Rubber	100	1000
224100-172	13 x 20	Natural Red Rubber	100	1000
224100-173	13 x 20	Gray Chlorobutyl/45	100	1000
224100-174	13 x 20	Gray Chlorobutyl-Isoprene Blend/40	100	1000
224100-175	13 x 20	Gray Chlorobutyl-Isoprene Blend/40 PTFE Faced	100	1000
224100-177	13 x 20	Black FKM	-	100
224100-178	13 x 20	Silicone	100	1000
224100-263	19 x 28	Gray Chlorobutyl-Isoprene Blend/40 PTFE Faced	-	100
224100-330	15 x 30	Natural Red Rubber	100	1000
224100-331	15 x 30	Gray Bromobutyl/50	100	1000

### Snap-On Style

This design provides maximum sealing for vials with a blow-back glass finish, which is a small ridge in the interior of the vial's neck. The snap-on stopper locks into the blow-back ridge, providing a tight seal and keeps the stopper from backing out. This style is not recommended for vials with a straight-walled finish. The blow-back feature is typically found in vials from North American manufacturers.

Catalog Number	For Mouth ID x OD (mm)	Stopper Material	Shelf Pack	Qty/Case
224100-080	7 x 13	Natural Red Rubber	100	1000
224100-081	7 x 13	Gray Chlorobutyl/45	100	1000
224100-180	13 x 20	Natural Red Rubber	100	1000
224100-181	13 x 20	Gray Chlorobutyl/45	100	1000
224100-342	15 x 30	Gray Bromobutyl/50	100	1000

See page 10 for more information on Stopper Formulations

UNLINED ALUMINUM SEALS are used in conjunction with stoppers to provide a secure closure for serum bottles and vials. Aluminum seals are available in a wide range of styles including open-top, center disc tear-out, and complete tear-off.

Choosing the correct aluminum seal involves determining the size needed. Seal diameters should correspond to the mouth OD of the chosen container. Serum bottles and vials typically have a 13 mm or 20 mm OD.



## Aluminum Seals

### Tear-Off

This seal can be completely removed and the contents readily poured from bottle.

Catalog Number	Color	For Mouth OD (mm)	Shelf Pack	Qty/Case
224192-01	Natural	13	100	1000
224192-05	Blue	13	100	1000
224192-06	Red	13	100	1000
224192-07	Green	13	100	1000
224193-01	Natural	20	100	1000
224193-05	Blue	20	100	1000
224193-06	Red	20	100	1000
224193-07	Green	20	100	1000
224197-01	Natural	30	100	1000

### Open-Top

Catalog Number	Color	For Mouth OD (mm)	Shelf Pack	Qty/Case
224177-01	Natural	13	100	1000
224177-05	Blue	13	100	1000
224177-06	Red	13	100	1000
224177-07	Green	13	100	1000
224178-01	Natural	20	100	1000
224178-05	Blue	20	100	1000
224178-06	Red	20	100	1000
224178-07	Green	20	100	1000

### Center Disc Tear-Out

The center disc tears out, exposing the top of the stopper to the syringe.

Catalog Number	Color	For Mouth OD (mm)	Shelf Pack	Qty/Case
224182-01	Natural	13	100	1000
224182-05	Blue	13	100	1000
224182-06	Red	13	100	1000
224182-07	Green	13	100	1000
224183-01	Natural	20	100	1000
224183-05	Blue	20	100	1000
224183-06	Red	20	100	1000
224183-07	Green	20	100	1000
224187-01	Natural	30	100	1000

### Solid-Top

These seals are excellent for long-term storage of samples.

Catalog Number	Color	For Mouth OD (mm)	Shelf Pack	Qty/Case
224191	Natural	20	100	1000

### Flip-Off® Center Tear

These seals are easy to use, autoclavable and tamper-evident. Push upward on the red plastic button to access the stopper or septum. There are no sharp metal edges to cut fingers or gloves. Plus, you can remove the Flip Cap button with one hand, freeing the other for the syringe.

Catalog Number	For Mouth OD (mm)	Shelf Pack	Qty/Case
224202	13	100	1000
224203	20	100	1000

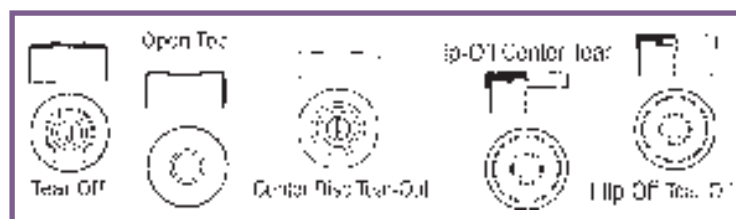
### Flip-Off® Tear-Off

Flip-Off Tear-Off aluminum seals feature an innovative closure that provides users with an improved tamper-evident package, an important consideration for user safety. Seals can be used for center tear-off and complete tear-off applications. The red plastic top will flip off easily with pressure from the thumb. This exposes the aluminum seal with center hole and pull ring. Contents can be accessed by syringe or the seal can be torn off completely by pulling on the center tear ring.

This seal addresses the need for a recyclable product, especially in Europe, because it allows the complete separation of plastic, aluminum, rubber and glass after use.

Catalog Number	For Mouth OD (mm)	Shelf Pack	Qty/Case
224208	20	100	1000

## Aluminum Seal Selection Chart



See page 6 for more information on reduced hand crimping with the Wheaton Crimpmaster® Crimping Station.

- Semi-automatic crimping
- Compatible with standard hand crimpers
- Functions using any standard in-house air supply or compressed air cylinder

# BOTTLES & VIALS



## Lab 45™ Graduated Bottles

Wheaton Lab 45 Media Bottles are ideal for freeze-drying when used with 224100-503 or 224100-507 slotted stoppers and 240736 screw cap. Lab 45s are manufactured from borosilicate glass and have a 45 mm screw-thread finish, a writing area, and approximate volume graduations.

The wide 45 mm finish facilitates filling and retrieving contents. Sloping shoulders allow for easy cleaning and complete drainage; the polypropylene pour ring eliminates drips. The bottles, caps, and pour rings are autoclavable.

### Bottle without Cap or Pour Ring

Catalog Number	Description	Dia x Ht (mm)	Screw Cap Size (mm)	Qty/Case
219915	Media Bottle, 100 mL	56 x 103	45	12

### Accessories

240736	Screw Cap, White PP, without Sealing Ring	-	45	12
240756	Pour Ring, Polypropylene	-	45	12
240760	Pour Ring, Red ETFE	-	45	10
224100-503	Black Lyophilization Stopper, Halobutyl/60	-	43	12
224100-507	Black Lyophilization Stopper, EPDM	-	43	12

\*Other sizes available



## S/T™ Bottles

These screw-thread-finish bottles are an alternative to serum bottles and vials. This bottle has a controlled ID and is designed for use with thin flange stoppers. Fits caps with 20-400 screw thread and I-Loc™ closures. It is manufactured from borosilicate glass (meets USP Type 1 standards). Autoclavable.

Cap Number	Fits (mL)	Qty/ (mm)	Catalog Normal Fill Size	Dia x Ht Rack	Screw Case
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### Wheaton Screw-Neck Diagnostic Bottles - Clear

219360	5	21 x 48	20-400	868805	480
219361	10	25 x 61	20-400	868806	480
219362	20	32 x 66	20-400	868615	480
219364	50	42 x 80	20-400	868615	288

### Wheaton Screw-Neck Diagnostic Bottles - Amber

219370	5	21 x 48	20-400	868805	480
219371	10	25 x 61	20-400	868806	480
219372	20	32 x 66	20-400	868615	480
219374	50	42 x 80	20-400	868615	288



## I-Loc™ Closures

These closures are specifically designed for diagnostic applications, and offer all the advantages of an aluminum seal and stopper with the convenience of a screw cap. The unique combination of a stopper and screw cap ensures excellent sealing characteristics, making

them ideal for liquid reagents. You can access sample contents using a syringe through the stopper or with a pipette after removing the screw cap.

Tolerances in the stoppers are maintained to +/-0.010". Autoclavable.

Catalog Number	Color	Size	Qty/Case
240676-01	Black	20-400	100
240676-02	White	20-400	100
240676-03	Red	20-400	100
240676-04	Blue	20-400	100
240676-05	Yellow	20-400	100



Catalog Number	Color	Size	Qty/Case
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### Open-Top Caps

240716-01	Black	20-400	300
240716-02	White	20-400	300
240716-03	Red	20-400	300
240716-04	Blue	20-400	300
240716-05	Yellow	20-400	300

### Closed-Top Caps

240706-01	Black	20-400	300
240706-02	White	20-400	300
240706-03	Red	20-400	300
240706-04	Blue	20-400	300
240706-05	Yellow	20-400	300

### Thin-Flange Lyophilization Stopper

224100-203	Gray	20 mm	300
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## Vacule®, Ampule

This small-volume lyophilization ampule can be flame-sealed or stored with a stopper in place. It is made of Wheaton 33™ low extractable borosilicate glass, (meets ASTM Type I Class A and USP Type I standards). A stopper can be purchased separately.

Catalog Number	Description	Dia x Ht (mm)	Approx. OD at Top (mm)	Fits Rack	Qty/Case
651446	2 mL Vacule	12 x 86	10	985800	144



## Vacule®, Pre-Scored Ampule

We designed these ampules for freeze-drying, protein hydrolysis, and micro-determination of ketones and amino acids. The long stems provide a convenient means for heat sealing under vacuum. A Gold Band® identifies the pre-scored feature, which allows easy opening. They are made of Wheaton 33™ low extractable borosilicate glass (meets ASTM Type I Class A and USP Type I standards).

Catalog Number	Size (mL)	Dia x Ht (mm)	Approx. OD at Top (mm)	Fits Rack	Qty/Case
651502	1	10 x 108	10	985800	144
651506	2	11.8 x 122	11.75	985800	144
651509	5	16.5 x 133	10	868810	144
651510	10	19.5 x 154	10	-	144



## Vacule<sup>®</sup>, with Screw Caps

Heavy wall construction designed for lyophilization and freeze-drying. Manufactured from Wheaton 33™ low extractable borosilicate glass (meets ASTM Type I Class A and USP Type I standards). Stoppers and accessories listed below.

Catalog Number	Size mL	Dia x Hgt mm	Accepts Cap Finish Size	Fits Rack	Qty/Case
651954	4	17 x 45	15-425	868810	200
651905	5	22 x 40	22-350	868805	200
651907	10	22 x 55	22-350	868805	200

### Cap & Stopper for 651954 4 mL Vacule

Catalog Number	Description	Qty/Pack	Qty/Case
224100-080	Red rubber stoppers	100	1000
224100-093	Lyophilization stoppers, two prong	100	1000
240209	Caps, solid top, rubber liner, 15-425 finish	200	200
W240509	Caps, open top, without liner, 15-425 finish	200	200

### Cap & Stopper for 651905 & 651907 5 & 10 mL Vacule

224100-172	Red rubber stoppers	100	1000
224100-194	Lyophilization stoppers, two prong	100	1000
224100-202	Lyophilization stoppers, three prong	100	1000
239853	Caps, solid top, without liner, 22-350	500	500



## Crimpmaster<sup>®</sup> Crimping Station

- Semi-automatic crimping
- Compatible with standard hand crimpers
- Functions using any standard in-house air supply or compressed air cylinder

This unit enables hand-operated crimpers and decappers to function in a semi-automatic mode. It accepts most standard hand crimpers and decappers, and requires inlet air pressure of 25 to 40 psi, which may be obtained from a compressed air cylinder or your standard in-house air supply. To operate, simply insert the proper crimper or decapper for the type of seal you wish to use, and depress the foot switch.

Dimensions: 19-3/4" x 6" x 8-5/8" (50.2 x 15.2 x 22 cm)

Weight: 13 lbs. (5.9 kg).

### The Crimpmaster<sup>®</sup> permits setup in 5 easy steps:

1. Attach a piece of 1/4" ID high pressure tubing (not supplied) from the Crimpmaster<sup>®</sup> foot switch assembly to an adjustable air pressure supply.
2. Connect supplied tubing to Crimpmaster<sup>®</sup> and foot switch assembly, and place assembly on floor.
3. Remove cushioned grips, adjustable stop screw, and handle retainer from the crimper (if so equipped).
4. Depress the handles and slide the unit into the Crimpmaster<sup>®</sup>.
5. Adjust the air pressure (25-40 psi) for the desired crimping tightness.

Catalog Number	Description	Qty/Case
224550	Crimpmaster <sup>®</sup>	1



## Air-Powered Crimpers

These lightweight, easy-to-use crimpers provide lab-scale or small-production-scale performance at a moderate cost, filling the gap between hand-operated machines and fully automatic equipment. They operate on standard laboratory air supply of 45 to 60 psi. Bottles and aluminum seals are automatically aligned to eliminate partially crimped seals. Exhaust air is passed through the foot-operated valve so the crimper can be used inside a sterile hood. A complete unit consists of a crimper, a foot valve mounted on a base plate, and connecting tubing and fittings, all packed in a polyethylene storage case. A

stand (available separately) supports the crimping jaws about 10" (26 cm) above the benchtop so both hands are free to manipulate the bottles. The heavy metal base has nonskid rubber feet.

Dimensions: 6-1/2" x 8" x 14"\* (16.5 x 20.3 x 35.6 cm) (WxDxH)

Weight: 20 lbs. (9.1 kg).

\* Dimensions and weight include unit plus stand

Catalog Number	Description	Qty/Case
224381	Attaches 11 mm Seals	1
224382	Attaches Standard 13 mm Seals	1
224383	Attaches Standard 20 mm Seals	1
224465	Stand	1



## E-Z Crimpers™

- Newly designed cushioned ergonomic handle
- Labeled for quick size identification
- Polished crimping jaws for consistent sealing
- Works with the Wheaton Crimpmaster<sup>®</sup> Crimping Station

An adjustable stop allows you to determine tightness of the seal while maintaining consistent crimping. 13 mm model features tapered jaws for easier vial access in rack. E-Z Crimpers™ can be autoclaved at 121° C. Autoclaving may change the appearance and or reduce product life.

Catalog Number	Description	Qty/Case
W225302	Attaches Standard 13 mm Seals	1
W225303	Attaches Standard 20 mm Seals	1



## Crimpers

These crimpers are used for flip cap seals and aluminum seals larger than 20 mm.

Catalog Number	Description	Qty/Case
224322	Attaches 13 mm Flip Cap Seals	1
224323	Attaches 20 mm Flip Cap Seals	1

# DECAPPERS & VIAL RACKS

WHEATON SCIENCE PRODUCTS autoclavable racks are manufactured from chemically resistant polypropylene or inexpensive expanded polystyrene



## E-Z Decappers™

- Newly designed cushioned ergonomic handle
- Labeled for quick identification
- Works with the Wheaton Crimpmaster® Crimping Station

These durable, lightweight, hand-operated decappers are an economical way to remove seals quickly and easily; just place the decapper on the seal and squeeze the handles together.

13 mm model features tapered jaws for easier vial access in racks. E-Z Decappers can be autoclaved at 121° C. Autoclaving may change the appearance and or reduce product life.

Catalog Number	Description	Qty/Case
W225351	Decapper, 11 mm	1
W225352	Decapper, 13 mm	1
W225353	Decapper, 20 mm	1

## Polypropylene Vial Racks



### 90-Position Rack for 17 mm OD Vials

This rack accommodates 90 vials ranging in size from 4 mL to 8 mL and 17 mm in diameter.

Dimensions: 13" x 6-3/4" x 1-1/4" (33 cm x 17 cm x 3 cm)(LxWxH)

Individual Opening ID: 17.1 mm

Catalog Number	Holds Vial	Well Configuration	Qty/Case
868810	3 mL Serum Tubing Vial	6 x 15	5

### 36-Position Rack for 23 mm OD Vials

This rack accommodates 36 vials up to 23 mm in diameter. Each well has an opening in the bottom to facilitate drainage.

Dimensions: 12-3/4" x 3-5/8" x 1-1/8" (32.2 cm x 9.1 cm x 2.8 cm) (LxWxH)

Individual Opening ID: 23.1 mm

Catalog Number	Holds Vial	Well Configuration	Qty/Case
868805	2 & 5 mL Serum Bottle, 5 mL Serum Tubing Vial	3 x 12	5

### 50-Position Rack for 28 mm OD Vials

This rack accommodates 50 vials up to 28 mm in diameter. Each well has an opening in the bottom to facilitate drainage.

Dimensions: 13" x 6-3/4" x 1-1/4" (33 cm x 17 cm x 3 cm) (LxWxH)

Individual Opening ID: 28.1 mm

Catalog Number	Holds Vial	Well Configuration	Qty/Case
868806	10 mL Serum Bottle	5 x 10	5

### 48-Position Rack for 15 mm OD Vials

Dimensions: 10-5/8" x 3-3/4" x 1-1/8" (26.6 cm x 9.4 cm x 2.8 cm)(LxWxH)

Individual Opening ID: 15.5 mm

Catalog Number	Holds Vial	Well Configuration	Qty/Case
868804	2 mL Serum Tubing Vial	4 x 12	5

## Disposable Plastic Racks

Inexpensive, lightweight, expanded polystyrene racks are convenient for storing and transporting a variety of bottles and vials used in the laboratory.



Catalog Number	Rack Capacity	Approx Cell ID x Depth (mm)	Qty/Case
868608	50	23 x 22	5
868615	48	43 x 32	8
868617	35	52 x 50	8

For additional products and information please visit our website: [www.wheatonsci.com](http://www.wheatonsci.com)

Liquid Handling Products aid in the semi-automatic filling of bottles and vials along with the Crimpmaster® Crimping Station's semi-automatic crimping function. Together these two steps greatly improve process efficiency and function.

## Omnispense® Plus

The Omnispense® Plus is a premium automatic dispenser known for its versatility and variable-speed. This peristaltic pump dispenser features a reverse-flow option for various dispensing and aspirating operations. It is perfectly suited for accurately dispensing liquids ranging in viscosity from aqueous solutions to medium syrups. The liquids being dispensed remain contained within the tubing, allowing for quick, non-contaminating changes, making this unit ideal for dispensing everything from perfume to cell culture media. This dispenser provides:



- Full microprocessor controls
- One-step volume calibration
- Self-prompting LCD display
- Programmable soft start
- Conformance with UL, CSA and CE standards

### PLUS:

- Built in constant flow rate dispenser. Fully programmable delivery of preset volume over a specific period of time with a display of the cumulative volume delivered.
- Handheld tubing holder with a start and stop switch. Excellent for remote filling or for use under a hood.
- Built-in tubing support. Conveniently holds the tubing for filling containers.
- Supports up to three pump heads. For easy multiple dosing.
- Expanded tubing sizes. The pump head supports many additional tubing sizes
- Dispense pull-back feature. Automatically dispenses the volume set, then reverses to relieve pressure in the tubing, thus helping to eliminate drips.
- LARGE, bright LCD display. For more comfortable viewing.
- Multi-language display prompts. The prompts are in English but they can be easily changed to French, German, Italian, Portuguese, or Spanish.
- Store up to 100 setups. For quick recall.
- External connection for remote start/stop. Also supplies pump running/stopped feedback.

### Specifications:

Standard pumphead W375020-A accepts (2.3 mm [0.09"] heavy wall) tubing 2, 3, 6, & 8 mm ID tubing

Optional pumphead W375023 accepts (1.6 mm [0.06"] wall) tubing

Accuracy: As high as 1% midrange

Dimensions: 6" wide x 12" deep x 10" high (15.2 x 30.5 x 25.4 cm)

Weight: 15 lbs. (6.8 kg)

Electrical Requirements: 100-120 VAC, 50/60 Hz, 70 watts

Approximate dispense ranges for various tubing sizes:

2.0 mm ID 1 – 2,400,000 mL

3.0 mm ID 1.5 – 3,300,000 mL

6.0 mm ID 2.2 – 10,500,000 mL

8.0mm ID 3.5 – 17,000,000 mL

Approximate flow rate ranges for various tubing sizes, +/- 3%:

2.0 mm ID: 0.34 mL/sec – 2.9 mL/sec

3.0 mm ID: 0.67 mL/sec – 5.9 mL/sec

6.0 mm ID: 2.19 mL/sec – 19.6 mL/sec

8.0 mm ID: 3.34 mL/sec – 29.1 mL/sec

Supplied with 3 mm ID and 6 mm ID tubing assemblies

Catalog Number	Description	Qty/Case
W375020-A	Omnispense Plus	1
W375022	Stackable Pumphead 2.3mm*	1
I050694	Footswitch	1
I054106	Support Stand	1

\*Up to 2 additional pumpheads can be added for a total of 3 pumpheads per unit.

## Additional Pumpheads

For 1.6mm (0.060") wall thickness tubing

Catalog Number	Description	Qty/Case
W375023	Pumphead, 1.6mm	1
W375024	Stackable Pumphead 1.6mm*	1
W375025	Cassette Pumphead, 5 Channel	1

## Replacement Tubing

Each tubing assembly is made up of a five-foot section of tubing (2.3 mm wall thickness) with a borosilicate glass sinker on one end and a polypropylene delivery nozzle on the other end.

Catalog Number	Description	Qty/Case
----------------	-------------	----------

## Silicone Tubing

374310	2 mm ID, 5-ft section (1.5 m) Assembly	1
374311	3 mm ID, 5-ft section (1.5 m) Assembly	1
374313	6 mm ID, 5-ft section (1.5 m) Assembly	1
374314	8 mm ID, 5-ft section (1.5 m) Assembly	1
374304	2 mm ID, 25 ft, Bulk	1
374305	3 mm ID, 25 ft, Bulk	1
374306	6 mm ID, 25 ft, Bulk	1
374308	8 mm ID, 25 ft, Bulk	1

## Dispenser Accessories

374320	Small Glass Sinker (2 mm & 3 mm)	6
374321	Large Glass Sinker (6 mm and 8 mm)	6
374322	Hose Barb/Luer Adapter for attaching manifold (2 mm & 3 mm)	1

## Socorex Calibrex® 520 Bottle Top Dispensers



- Autoclavable, fully assembled
- Performance stability, Solid Calibration®
- High chemical resistance
- Easy in-lab calibration
- User-friendly volume selection
- Rotates 360° on the bottle

## Accuracy and Dependability

This bottle top dispenser has a sophisticated yet simple design to ensure ease of operation, superior safety, and low maintenance. The dispenser delivers accuracy and long-term reproducibility through Solid Calibration. A series of calibrated, permanently fixed stops make volume selection quick and repeatable, not dependent on operator skill. The wetted components are chemically inert.

The dispensers fit bottles with a 33 mm screw-neck finish and are supplied with adapters to fit 28, 38, and 45 mm finishes.

Catalog Number	Capacity (mL)	Adjustable Increments (mL)	Accuracy %	Reproducibility CV%	Qty/Case
844000	0.25 - 2	0.05	<+/-0.7%	<0.1%	1
844002	1 - 5	0.10	<+/-0.7%	<0.1%	1
844004	1 - 10	0.25	<+/-0.7%	<0.1%	1

# LYOPHILIZATION APPLICATION NOTE

## Market Application:

Lyophilization, also known as “freeze drying”, is the process of removing all liquid (water in most cases) from a sample to prolong the shelf life of the product. Long term storage stability of biological materials has made this a preferred technique at biochemical/biotech and pharmaceutical companies and at University and Medical Schools for samples such as blood plasma, vaccine, serum, tissue samples, enzymes, and microbial cultures. The food / beverage industry also uses this technique.

## Product Application:

The primary containers used for lyophilization tray drying are serum bottles, serum vials, and to a much lesser extent ampules. The prime accessory is the split stopper **1** which has been designed to sit on the top of the container **2** during the lyophilization process, and is inserted **3** during the stoppering step in the process. **4** The closure (aluminum seal or threaded cap) is then applied. The split stopper is utilized when the dried product is sensitive to air or moisture and needs a rapid seal. Not all freeze dried materials are this sensitive or will require use with the split stopper.

## Process: (takes from 10 to 25+ hours)

- Pre-freeze sample
- Sample and liquid frozen solid
- Primary Drying; removes over 90% of water from sample
- Secondary Drying; removes residual bound water and heat required

## Freezing Methods:

The removal process uses sublimation or conditions where the liquid is frozen or put into the Solid Phase and removed in the Vapor Phase (under reduced pressure or under vacuum) without going through the Liquid Phase. Liquid Phase removal into the Vapor Phase via boiling, is undesirable and for certain biological materials such as RNA, the addition of heat severely reduces biological activity and disqualifies it as a removal technique for these materials.

As sublimation proceeds, voids are left in the dry residual creating a path for water vapor to escape, which makes it easy to rehydrate or add water back. Material that rehydrates easily is said to be lyophilic (solvent loving), the freeze-dried product is said to be lyophilized.



SLANT (greater surface area)  
SLANT is the preferred freezing method



STUB (limited surface area)

1



Components

2



Stoppered for Lypho

3



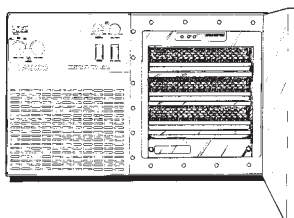
Stoppered

4

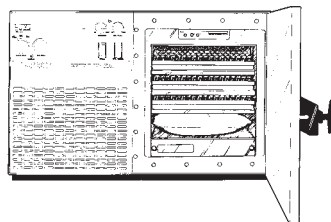


Crimped Seal

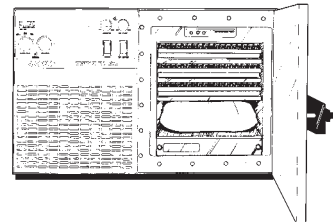
## Freeze-drying Process



The Stoppering Tray dryer may be loaded with unstoppered vials or bottles on all three shelves. Stoppers should be inserted in vial or bottle openings in the raised position.



When the stoppering control is activated, atmospheric pressure causes the diaphragm to expand. Pressure from the expanding diaphragm causes the bottom shelf to rise until the loaded tray makes contact with the shelf above it.



The diaphragm continues to expand until all three shelves have made contact with each other allowing all vials or bottles to be stoppered under vacuum.

Compliments of LabConco

# RUBBER STOPPER FORMULATIONS

## Rubber Stopper Formulation Characteristics

	Gray Bromobutyl/50	Gray Bromobutyl/60	Gray Chlorobutyl/45	Gray Chlorobutyl/50	Gray Chlorobutyl/55	Gray Chlorobutyl Isoprene Blend/40	Gray Chlorobutyl Isoprene Blend/50
<b>Typical Properties:</b>							
Base Polymer	Bromobutyl	Bromobutyl	Chlorobutyl	Chlorobutyl	Chlorobutyl	Chlorobutyl Isoprene Blend	Chlorobutyl Isoprene Blend
Durometer (shore A +/- 5)	50	60	45	50	55	40	50
Specific Gravity	1.35	1.47	1.24	1.30	1.38	1.15	1.46
Ash %	44.9	51.1	38.4	42.7	47.9	29.5	55.7
UV Spectrum	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
IR Spectrum	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
<b>Typical Extraction Data, USP:</b>							
Distilled Water							
pH Change	0.0	0.0	- 0.2	- 0.2	- 0.3	+0.6	+0.6
Reducing Agents, ml, .01N I2	0.0	0.0	0.0	0.0	0.0	0.0	0.01
Turbidity, NTU	1.5	0.65	1.0	0.1	1.0	10	38
Total Solids, mg/100 mL	0.8	0.8	0.0	0.4	1.0	0.77	0.73
Zinc, ppm	0.8	0.8	0.2	0.3	0.3	0.3	1.2
Lead, ppm	<0.5	<0.5	<0.5	<0.5	<0.5	0.0	0.0
<b>Toxicity Data:</b>							
Acute Systemic	Passes	Passes	Passes	Passes	Passes	Passes	Passes
Intracutaneous Reactivity	Passes	Passes	Passes	Passes	Passes	Passes	Passes
Cytotoxicity	Passes	Passes	Passes	Passes	Passes	Passes	Passes

Black EPDM    Gray Halobutyl/50    Black Halobutyl/60    Pink Rubber    Red Rubber\*    Silicone    Black FKM

	Black EPDM	Gray Halobutyl/50	Black Halobutyl/60	Pink Rubber	Red Rubber*	Silicone	Black FKM
<b>Typical Properties:</b>							
Base Polymer	EPDM	Halobutyl	Halobutyl	Isoprene	Isoprene	Silicone	FKM
Durometer (shore A +/- 5)	60	50	60	45	40	55	55
Specific Gravity	1.08	1.3	1.43	1.65	1.25	1.14	1.87
Ash	10.6	—	51.2	55.6	38.9	—	—
UV Spectrum	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	—
IR Spectrum	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	—
<b>Typical Extraction Data, USP:</b>							
Distilled Water							
pH Change	+0.4	0.2	-0.3	+1.5	+0.1	-0.3	0.4
Reducing Agents, ml, .01N I2	0.0	0.0	—	0.0	0.1	0.1	0.11
Turbidity, NTU	5	0.0	5	34	63	1.0	0.0
Total Solids, mg/100 mL	0.8	1.6	0.5	1.9	2.2	0.0	0.4
Zinc, ppm	0.6	0.5	0.5	0.3	0.3	0.0	<0.05
Lead, ppm	0.0	—	0.0	0.1	0.0	<0.5	<0.5
<b>Toxicity Data:</b>							
Acute Systemic	Passes	Passes	Passes	Passes	Passes	—	—
Intracutaneous Reactivity	Passes	Passes	Passes	Passes	Passes	—	—
Cytotoxicity	Passes	—	Passes	—	—	Passes	Passes

Note: All stopper formulation data presented above is general information. Specific laboratory results are available upon request. It is recommended that all stoppers be thoroughly tested by the customer for compatibility.

\*Data does not apply to sleeve stoppers

## Rubber Stopper Formulation Descriptions

**Gray Bromobutyl/50** General-purpose bromobutyl formulation for packaging of parenteral solutions. Exhibits low levels of extractables in broad pH range of 3.5 to 9.5. Excellent tolerance to water solutions containing alcohol and propylene glycol.

**Gray Bromobutyl/60** Same characteristics as Gray Bromobutyl/50, but with a higher durometer.

**Gray Chlorobutyl/45** A general-purpose butyl rubber compound developed for pharmaceutical closure applications. 100% chlorobutyl compound with excellent oxygen and MVT characteristics and low extractables. It is recommended for serum vial stoppers and various other products requiring a soft, clean butyl compound with good resealability.

**Gray Chlorobutyl/50** Same characteristics as Gray Chlorobutyl/45, but with a higher durometer. Developed primarily for lyophilization stoppers.

**Gray Chlorobutyl/55** Same characteristics as Gray Chlorobutyl/45, but with a higher durometer.

**Gray Chlorobutyl-Isoprene Blend/40** Developed for applications requiring a combination of low extractables, heat resistance and the superior reseal characteristics of isoprenes.

**Gray Chlorobutyl-Isoprene Blend/50** Same characteristics as Gray Chlorobutyl-Isoprene Blend/40, but with a higher durometer.

**Black EPDM** Exhibits high levels of heat resistance, excellent compression set and re-seal characteristics. Low extractable formulation.

**Gray Halobutyl/50** Formulation has low zinc in water extracts and no Thiazole ingredients. Its MVT properties make it suitable for lyophilization stoppers.

**Black Halobutyl/60** Same characteristics as Gray Halobutyl/50, but black in color with a higher durometer.

**Pink Rubber** A pink polyisoprene formulation similar to natural rubber in coring and re-seal characteristics.

**Red Rubber** This is a polyisoprene formulation, similar to natural rubber in coring and re-seal characteristics.

**Silicone** A translucent silicone with excellent heat aging and compression set characteristics and low extractables.

**Black FKM** Excellent chemical resistance. Good resealing characteristics. Good for chlorinated solvents.



**WHEATON**

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