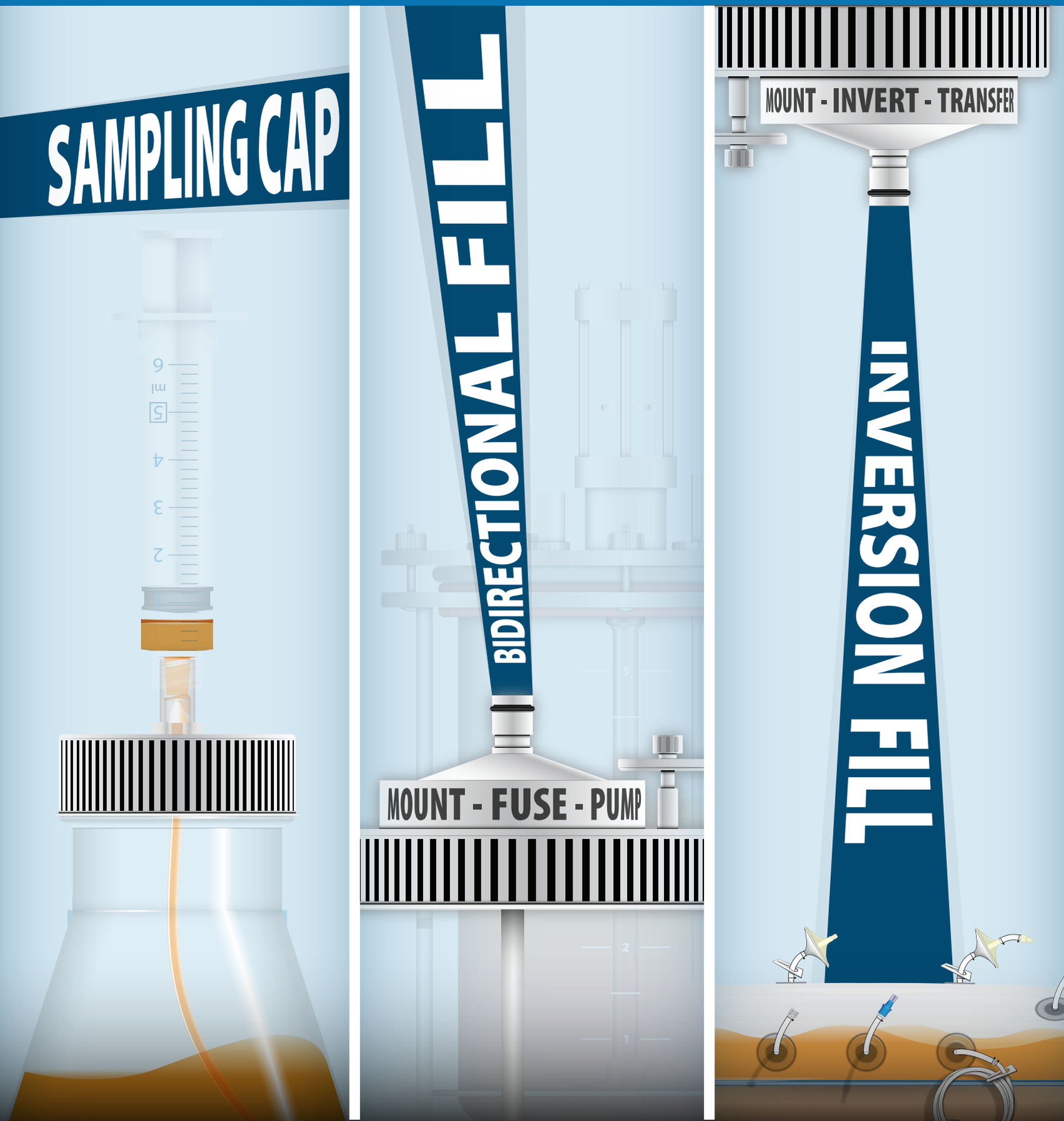
THOMSON Solutions ™ At Work
INSTRUMENT COMPANY

OPTIMUM GROWTH™ CAP OPTIONS: SAMPLING, FEEDING & TRANSFER

FAST ASEPTIC STERILE TRANSFER OF FLUIDS FROM OPTIMUM GROWTH™ FLASKS TO FLASKS, BAGS OR BIOREACTORS



SAMPLING CAP

The Sampling Cap is ventilated for cultivation and has a one way valve allowing for aceptic sampling of cells while the flasks remain in the shaker. This minimizes time to a 1 minute operation. One will also eliminate flask removal into the hood from the shaker, reducing contamination chances, and mix up or other error from additional steps. Interruption of culturing process is minimized.

The Sampling Cap option is available for the 125mL, 250mL and 500mL Optimum Growth™ Flasks.

OLD SAMPLING METHOD:

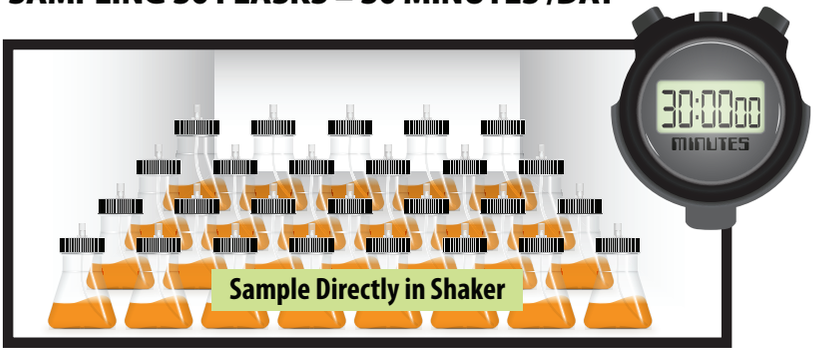
1. Remove flask from shaker
2. Spray down flask before putting in the hood
3. Placing Flask in the hood
4. Removing Cap
5. Taking sample
6. Replace cap
7. Put back in shaker

THOMSON IMPROVED SAMPLING METHOD:

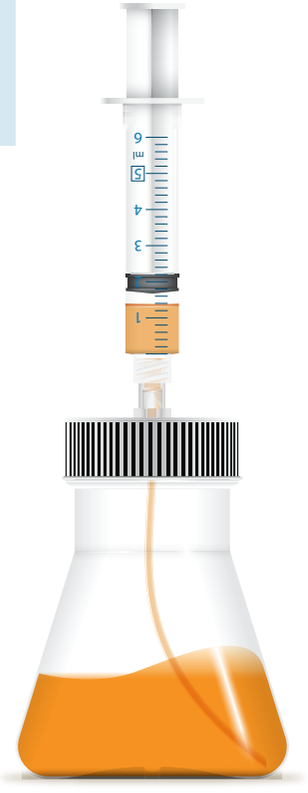
1. Sample flask while in the shaker

The Sampling Cap is ventilated and stays on during cultivation.

SAMPLING 30 FLASKS = 30 MINUTES /DAY



Thomson Method 30 flasks in 30 minutes



Flask Size	125mL Flask	250mL Flask	500mL Flask
Description	 Optimum Growth™ 125mL Flask, w/Sampling Port	 Optimum Growth™ 250mL Flask, w/Sampling Port, Sterile	 Optimum Growth™ 500mL Flask, w/Sampling Port, Sterile
Cat. No.	931110-SP	931111-SP	931112-SP
Tubing Connection	Male Luer Lock		
Tubing Diameter	n/a		
Tubing	n/a		
Length of tubing	n/a		
Top Style	Threaded		
Cap Material	PP (polypropylene)		
Sterility	10^{-6}		
Air Filter/Ventilation	0.2 µm PTFE vent filter for cultivation and pressure relief		
Qty/CS	50		25

INVERSION TRANSFER CAPS

The Sterile Inversion Transfer Caps (patented), allow for the simple aseptic transfer of media or cells to cell bags, bioreactors, or flasks (from all manufacturers).

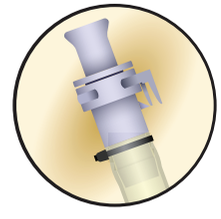
The Inversion Transfer Cap works with the 1.6L and 5L Thomson Optimum Growth™ Flasks (patented). Simply, replace the culture cap with the Transfer Cap and connect to your vessel of choice.

HOW TO TRANSFER?

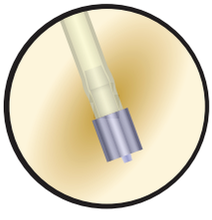
To transfer, invert the Optimum Growth™ Flask and let gravity do the rest. The Optimum Growth™ Flask and Transfer Cap System eliminates the need to transfer cells to an intermediate flask for scale up. **Inversion or gravity feed has the lowest shear force of any transfer method available.**

The Inversion Transfer Cap in conjunction with the 1.6L and 5L Thomson Optimum Growth™ Flasks (patented) product line can be used for reagent addition, seeding of larger bioreactors cell bags, or other liquid media transfers.

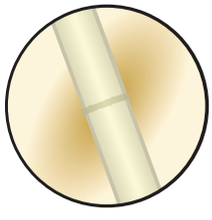
CONNECTION OPTIONS



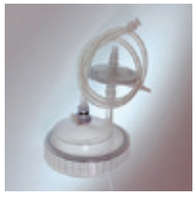
QUICK CONNECT



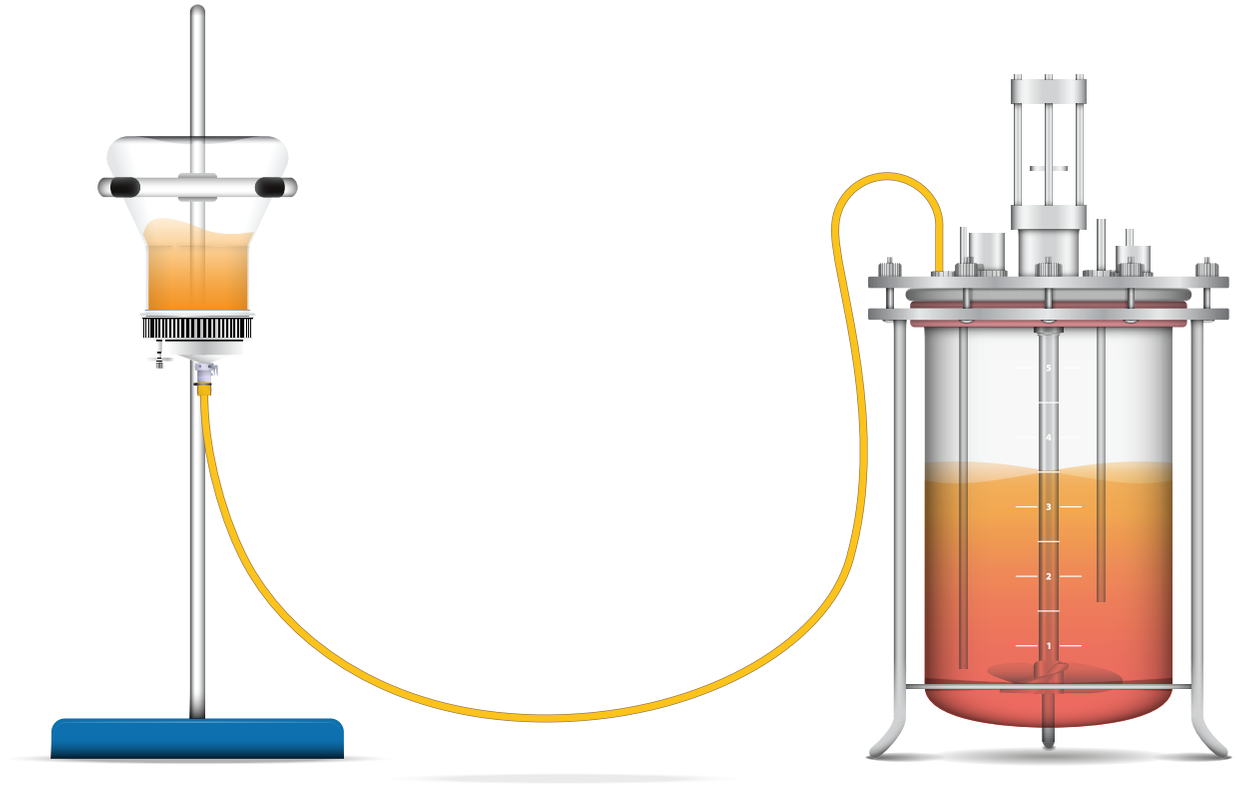
LUER LOCK



TUBE FUSING

Flask Size	1.6L			
				
Description	Inversion Transfer Cap for Optimum Growth™ 1.6L Flask, 7/16" Male Connection -- Sterile	Inversion Transfer Cap for Optimum Growth™ 1.6L Flask, with 2' Tubing with Luer Lock -- Sterile	Inversion Transfer Cap for Optimum Growth™ 1.6L Flask, 2' Tubing to weld to 1/4" C-Flex 16 -- Sterile	Inversion Transfer Cap for Optimum Growth™ 1.6L Flask, 2' Tubing to weld to 7/16" C-Flex 24 -- Sterile
Cat. No.	931706	931710	931705	931708
Tubing Connection	7/16" (11.1mm) Barb	Female Luer Lock	Tube Fuse	Tube Fuse
Tubing Diameter	n/a	C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)	C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)	C-Flex 24 ID: 3/16" (4.76mm), OD: 7/16" (11.1mm)
Tubing	n/a	Chemically resistant, heat sealable, flexible		
Length of tubing	n/a	24" (609.6mm)		
Top Style	Threaded			
Cap Material	PP (polypropylene)			
Sterility	10^{-6}			
Air Filter/Ventilation	0.2 µm PTFE vent filter for cultivation and pressure relief			
Qty/Cs	4 or 20			

INVERSION TRANSFER CAPS



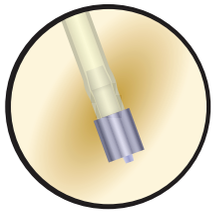
Flask Size	5L				
Description	 Inversion Transfer Cap for Optimum Growth™ 5L Flask, 1/4" Barb Connection -- Sterile	 Inversion Transfer Cap for Optimum Growth™ 5L Flask, 7/16" Male Connection -- Sterile	 Inversion Transfer Cap for Optimum Growth™ 5L Flask, with 2' Tubing with Luer Lock -- Sterile	 Inversion Transfer Cap for Optimum Growth™ 5L Flask, 2' Tubing to weld to 1/4" C-Flex 16 -- Sterile	 Inversion Transfer Cap for Optimum Growth™ 5L Flask, 2' Tubing to weld to 7/16" C-Flex 24 -- Sterile
Cat. No.	931594	931596	931616	931595	931598
Tubing Connection	1/4" (6.35mm) Barb	7/16" (11.1mm) Barb	Female Luer Lock	Tube Fuse	Tube Fuse
Tubing Diameter	n/a		C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)	C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)	C-Flex 24 ID: 3/16" (4.76mm), OD: 7/16" (11.1mm)
Tubing	n/a		Chemically resistant, heat sealable, flexible		
Length of tubing	n/a		24" (609.6mm)		
Top Style	Threaded				
Cap Material	PP (polypropylene)				
Sterility	10^{-6}				
Air Filter/Ventilation	0.2 µm PTFE vent filter for cultivation and pressure relief				
Qty/Cs	4 or 20				

BIDIRECTIONAL TRANSFER CAP

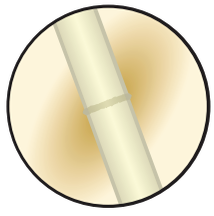
The Sterile Optimum Growth™ Bidirectional Transfer Caps (patented) with downstem, allow for easy aseptic transfer of media or cells into and/or out of cell bags, bioreactors, and flasks (from all manufacturers).

The Bidirectional Transfer Cap with downstem works with the 1.6L and 5L Thomson Optimum Growth™ Flasks (patented) and your peristaltic pump. Simply, replace the culture cap with the Transfer Cap and connect to your vessel of choice.

CONNECTION OPTIONS



LUER LOCK



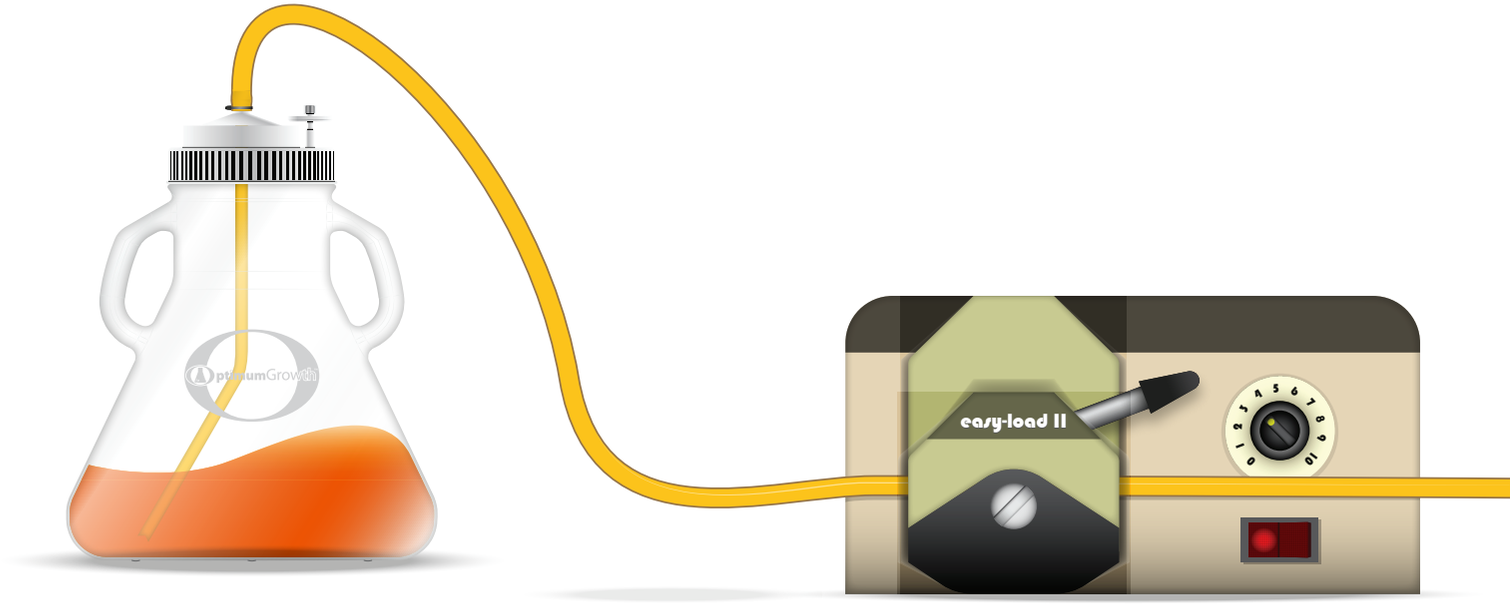
TUBE FUSING

HOW TO TRANSFER OR FEED

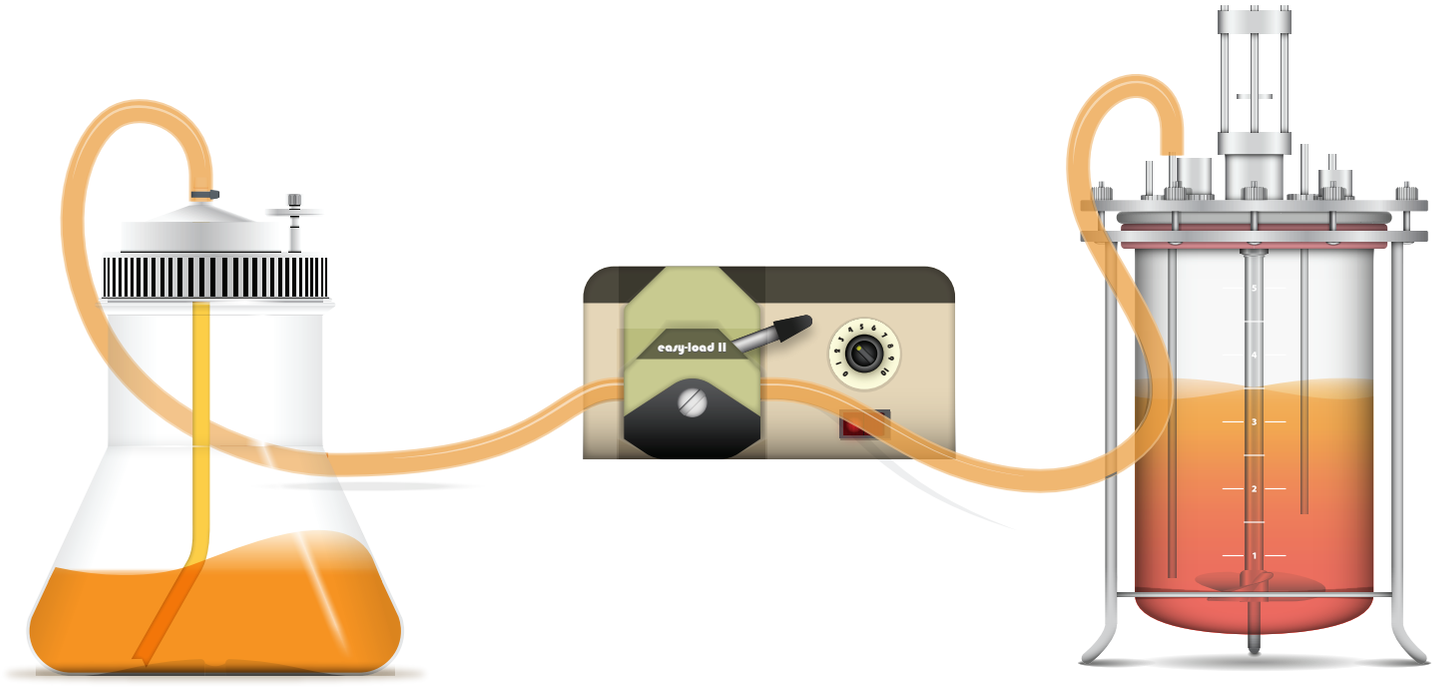
1. Connect to your receiving vessel by Tube Fusing or using our Luer Lock option
2. Place the silicone tubing in the peristaltic pump head
3. Liquid can then be pumped either into or out of the flask

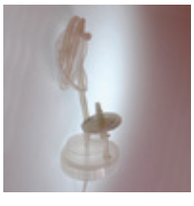
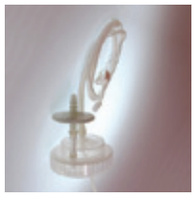
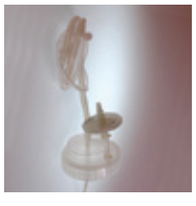
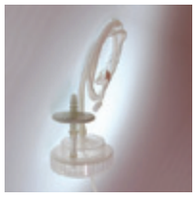
Optimum Growth™ Flasks (patented) in conjunction with the Transfer Cap system eliminates the need to move cells to an intermediate transfer for scale up or seed cultures. The ability to pump into the Optimum Growth™ Flask (patented) makes filling with media from a bulk source a simple aseptic method. The Transfer Cap in conjunction with the Thomson Optimum Growth™ Flask (patented) product line can be used for reagent addition, seeding of larger bioreactors or cell bags, pumping of media into flasks from large drums or bags of media, and other liquid media transfers into and out of bioreactors.

The Optimum Growth™ Flasks come in multiple sizes of 125mL, 250mL, 500mL, 1.6L and our popular 5L.



BIDIRECTIONAL TRANSFER CAP



Flask Size	1.6L		5L	
				
Description	Bidirectional Transfer Cap for Optimum Growth™ 1.6L Flask, for Peristaltic Pump, 2' Tubing with Luer Lock -- Sterile	Bidirectional Transfer Cap for Optimum Growth™ 1.6L Flask, for Peristaltic Pump, 2' tubing welds to 1/4" C-Flex 16 -- Sterile	Bidirectional Transfer Cap for Optimum Growth™ 5L Flask, for Peristaltic Pump, 2' Tubing with Luer Lock -- Sterile	Bidirectional Transfer Cap for Optimum Growth™ 5L Flask, for Peristaltic Pump, 2' tubing welds to 1/4" C-Flex 16 -- Sterile
Cat. No.	931702	931704	931618	931614
Tubing Connection	Tube Fuse			
Tubing Diameter	C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)	C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)	C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)	C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)
Tubing	Chemically resistant, heat sealable, flexible			
Length of tubing	24" (609.6mm)			
Top Style	Threaded			
Cap Material	PP (polypropylene)			
Sterility	10^{-6}			
Air Filter/Ventilation	0.2 µm PTFE vent filter for cultivation and pressure relief			
Qty/Cs	8			

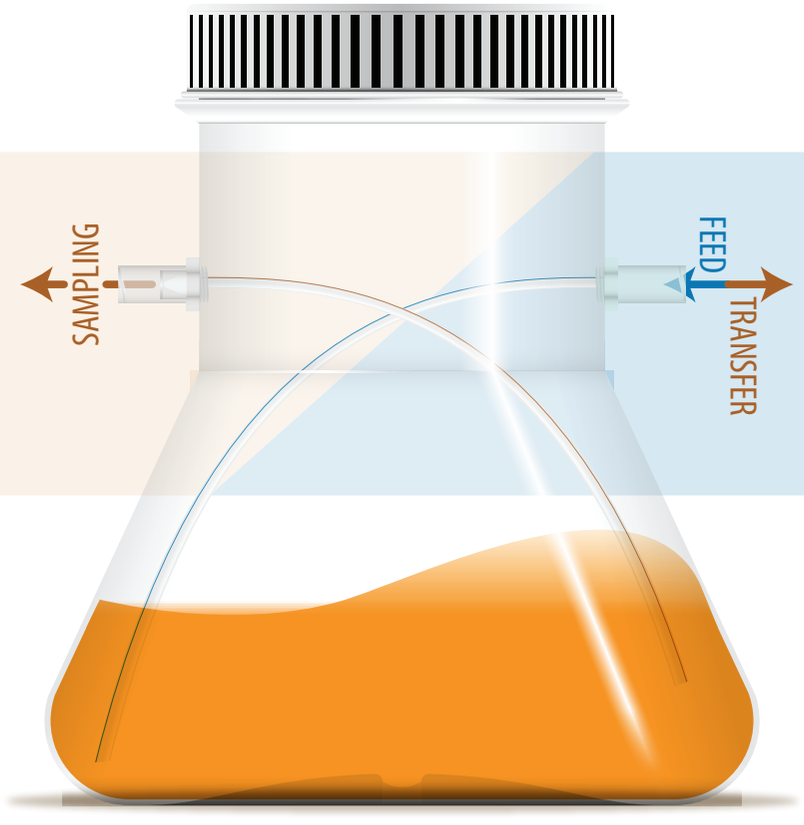
MULTIPORTED ASEPTIC OPTIMUM GROWTH™ FLASK
FLASK WITH BIDIRECTIONAL TRANSFER/FEED & SAMPLING ABILITY

The multiported flask is completely aseptic, making it the perfect start for initial seed cultures that seed bioreactors in multiple stages of clinical drug production. Other uses for the Multiported Aseptic Optimum Growth™ Flasks include keeping cell lines alive and other manufacturing functions.

The Multiported Aseptic Optimum Growth™ Flask was born out of necessity from biopharmaceutical companies requiring a completely aseptic process. These Multiported Flasks have replaced the process from starting point:

- **Sterile tube fuse inoculation**
- **Consistent ability to do multiple day additions**
- **1-way valve sampling allowing for a simple use in a shaker.**
- **Eliminated the need for under 20L cell bags**
- **Replaces current process requiring tube fusing for inoculation.**
- **Consistently allows for multiple day additions.**
- **Aseptic 1-way sampling valve.**
- **Allows for simple use within a shaker**
- **Great for aseptic manufacturing; never any opening needed preventing potential contamination.**

A one way sample port allows safe sampling of cells while the flasks remain in the shaker.



A two way port allows feeding of media during growth and transfer to bioreactor for seeding a larger production growth.

1.6L TRT flask shown

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5L TRT Flask, Sample port side

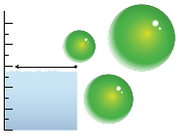
5L TRT Flask, Transfer side

Flask Size	5L	1.6L
Description	 Multiported Aseptic Flask Flask with Bidirectional Transfer/Feed & Sampling ability	 Multiported Aseptic Flask Flask with Bidirectional Transfer/Feed & Sampling ability
Cat. No.	931116-PORT-D-TRT	931113-PORT-TRT
Tubing Connection	Tube Fuse	
Tubing Diameter	C-Flex 16 ID: 1/8" (3.1mm), OD: 1/4" (6.35mm)	
Tubing	Chemically resistant, heat sealable, flexible	
Length of tubing	24" (609.6mm)	n/a
Top Style	Threaded	
Cap Material	PP (polypropylene)	
Sterility	10^{-6}	
Qty/CS	4	12

OPTIMUM GROWTH™ FLASKS

KEY FEATURES

- Baffles designed for High Aeration & Low Shear
- Same Footprint as Comparable Fernbach Flask
- Less Foaming than Disposable Fernbach
- Transfer Cap connects directly to Wave Bags™ & bioreactors with Quick Connect or tube fusing
- .2 µm Vented Cap
- Individually Packaged and Sterilized



Fill Volumes & Shake Speeds

For all tables
1" = 25mm
2" = 50mm

CHO Stable Cells, CHO Transient, HEK 293 Transient

Flask Size	Best Fill Volume	*RPM in 1"/2"
125mL	63mL	150 / 110
250mL	150 mL	150 / 110
500mL	250mL	150 / 110
1.6L	900mL	150 / 110
5L	2.0L-3.0L	120 / 90

Insect Cells

Flask Size	Best Fill Volume	*RPM in 1"/2"
125mL	63mLs-75mL	150 / 110
250mL	150 mL	150 / 110
500mL	250mL	150 / 110
1.6L	900mL	150 / 110
5L	2.0L - 3.0L	135 / 90

Hybridoma Cells

Flask Size	Best Fill Volume	*RPM in 1"/2"
125mL	36mL	70 / 50
250mL	75mL	70 / 50
500mL	150mL	70 / 50
1.6L	480mL	70 / 50
5L	1.5L	80 / 60

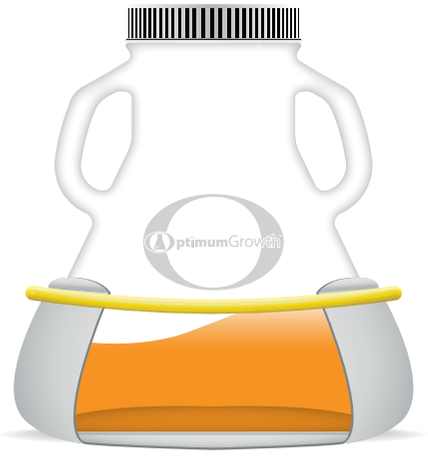
Microbes/E.coli

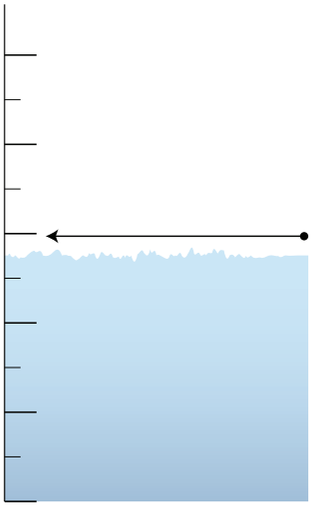
Flask Size	Best Fill Volume	*RPM in 1"/2"
125mL	63mL	250 / 150
250mL	125 mL	250 / 150
500mL	250mL	250 / 150
1.6L	900mL	250 / 150
5L	2.0L-3.0L	250 / 150

Minimum Fill Volume
(CHO Stable Cells, CHO Transient, HEK 293 Transient)

Flask Size	Minimum Fill Volume	*RPM in 1"/2"
125mL	24mL	120 / 90
250mL	50 mL	120 / 90
500mL	100mL	120 / 90
1.6L	400mL	100 / 80
5L	1.2L	90 / 70

* Shake speed for 1" orbit / 2" orbit (RPM)





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NOTES:

OPTIMUM GROWTH™ FLASK PART NUMBERS

Part #	Description	Qty/Case
931110	Optimum Growth™ 125mL Flask Sterile Patented	50
931111	Optimum Growth™ 250mL Flask Sterile Patented	50
931112	Optimum Growth™ 500mL Flask Sterile Patented	25
931113	Optimum Growth™ 1.6L Flask Sterile Patented	12
931113-PORT-TRT	Multiported Aseptic Flask Flask with Bidirectional Transfer/Feed & Sampling ability	12
931114	Optimum Growth™ 2.8L Flask Sterile Patented	6
931116	Optimum Growth™ 5L Flask Sterile | Use with Transfer Cap | Patented	4
931116-Port	Optimum Growth™ 5L Flask Sterile w/Port Patented	4
931116-PORT-D-TRT	Optimum Growth™ 5L Flask with Port & Transfer Tubing Sterile Patented	4

NOTES:

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