To Our Valued Customer

We are very pleased and excited to present our 2005 Catalog. Not only is this our first comprehensive catalog in over three years, it marks the integration of two great companies, an entirely new product portfolio consisting of over 350 products, our new company image, and a new brand of tips and tubes.

What you will find inside this catalog is amazing in terms of breadth and depth for a consumables catalog. It is, in fact, the definitive resource when it comes to liquid handling in the modern life-science laboratory. Within these covers you will find a wealth of technical data that directly relates to your everyday laboratory needs; when it comes to product selection, you will find that you may now choose from the largest and most consistent line of pipet tips and PCR tubes in the world.

Additionally, this catalog not only contains flagship product lines such as ART (Aerosol Resistant Tips) and BioRobotix brand tips for automated workstations, it also includes, advanced products for PCR, and our newest brand offering: HydroLogix Pipet Tips and HydroLogix Microcentrifuge Tubes.

While planning the HydroLogix product offering we were challenged to describe by name, the most extensive tip and tube product offering in the world. We were further challenged by the fact that we take great pride in the quality of our products and the efforts of our employees in producing them for you to use in the most sophisticated applications ever conceived. To help us overcome these challenges we turned to our customers.

One customer shared the idea that the word “hydrologic” is a direct reference to the circulation and conservation of the Earth’s water. Since water is the essential requirement for all life on Earth and the goal of life science is to improve life through understanding gained by logical, methodical research, the name Hydrologix most closely fit the purpose for which our products are used. In addition, the movement of all aqueous based solutions in the lab are indeed part of the Global Hydrologic Cycle. HydroLogix is “The Intelligent Choice for Discovery.”

Ordering Information

Molecular BioProducts sells its wide range of disposable laboratory products through a worldwide network of distributors. To find a distributor near you, or for assistance in obtaining distributor catalog numbers and pricing, please visit our website or contact our friendly customer service representatives.

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Warranty

Molecular BioProducts, inc., warrants that its products conform to all applicable laws and that they will perform as represented. Molecular BioProducts, inc., disclaims all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular purpose other than those expressly set forth in the product labeling. In no event will Molecular BioProducts, inc., be liable for any incidental, indirect, or consequential damages in connection with the purchase or use of its products.

MBP

Table of Contents

	Product	Page
Section 1	ART Brand Barrier Pipet Tips	2
Section 2	HydroLogix Brand Unfiltered Tips	24
Section 3	BioRobotix Brand Tips for Automated Workstations	46
Section 4	PCR Products	68
Section 5	Advanced PCR Products	74
Section 6	Microcentrifuge Tubes	84
Section 7	Storage Racks	94
Section 8	Electroporation Cuvettes	100
Section 9	Reference Information	104
	Index	106
	Glossary	108
Appendix A:	Automated Instrumentation Section	
	A.1: BioRobotix Troubleshooting	115
	A.2: MBP Beckman Biomek FX 10µl Tip Set-up	116
	A.3: MBP Beckman Biomek FX 20µl Tip Set-up	117
	A.4: MBP Beckman Biomek FX 200µl Tip Set-up	118
	A.5: Suggestions for Deck Positioning on the Beckman Biomek FX	119
Appendix B:	10 Tips to Improve your Pipetting Technique	121
Appendix C:	%CV and Accurate Sample Delivery	122
Appendix D:	Units, Metric Prefixes, Conversion Factors, pH Values, and Symbols	123
Appendix E:	Chemicals (Acids and Bases) and Isotopes	125
Appendix F:	Troubleshooting and Solutions to Pipetting Errors	126
Appendix G:	DNA & Nucleotide Molecular Weight Conversions	127
Appendix H:	Protein Conversions	128
Appendix I:	ART Pipettor Fits Chart	130
Appendix J:	HLT Pipettor Fits Chart	137
Appendix K:	Packaging Configurations	146

"The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' but 'That's funny…'"

Isaac Asimov

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ART Pipet Tips

MBP • SECTION 01

Index		Product	Page
1		Standard ART Tips	8
2		Ergonomic ART Tips	12
	a.	Rainin LTS	13
	b.	Gilson/Pipetman	14
	c.	Thermo LabSystems Finnpipette	15
3		Low Retention ART Tips	17
4		Specialty ART Tips	
	a.	Gel Loading	18
	b.	Wide Bore	19
	c.	REACH	21
	d	Solvent Safe	22
5		ART Pipettor Fits Chart	130

Why ART Brand Pipet Tips are the Researcher's Choice

Researchers the world over have made ART brand pipet tips their first choice in contamination control for one reason – they are the only Aerosol Barrier Tip available that guarantee 100% protection against not only aerosol, but liquid contamination of your pipettor. It is the contamination of your instrument that is usually the cause of carryover contamination in PCR experiments. For more information on other sources of contamination please read "Control of Contamination Associated with PCR and Other Amplification Reactions" located on our website at www.mbpinc.com.

The reason behind the ART tips' incredible success is quite simple; ART tips contain a patented interactive barrier whose porous structure actually closes and seals when in contact with airborne aerosols or aqueous based solutions used in the modern life-sciences lab. There are some unique advantages to this technology when compared to the filters found in aerosol tips manufactured by other companies.

"…filters used in other tips have a porous structure that is much larger than that of the compounds from which you are trying to protect your instruments, labs, and samples."

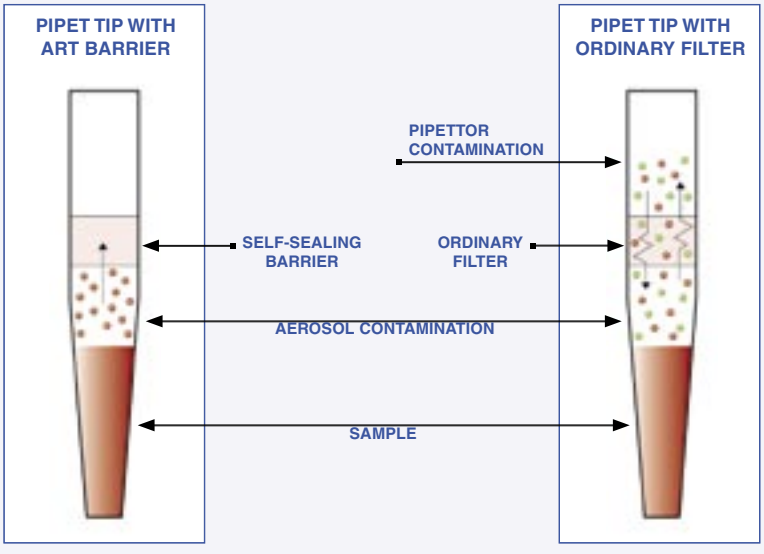
The first and most obvious is that the ART barrier is just that - a barrier - not a filter. In the 12 years we have been perfecting this technology we have been confronted again and again by this simple difference – the filters used in other tips have a porous structure that is much larger than that of the compounds from which you are trying to protect your instruments, labs, and samples. This has led many of our competitors to emulate the ART tip by using very dense "super filters" to make their products more effective – and this has worked to some degree, but with draw backs. When reducing the size of the pores in a filter tip below 20 microns, air displacement through the pipet tip is severely constricted. This leads to delayed draws, mis-pipetting, decreased accuracy and decreased precision due to natural variations in the filters.

However, the interactive nature of the ART Barrier allows us to create a porous structure of about 40 microns without fear of contamination since any pores that come into contact with aqueous based solutions will close, trapping potential contaminants within the porous structure. It is this wider pore specification that provides you with a clean, smooth aspiration, and an accurate, precise dispense time after time. There is a very simple way to demonstrate this within your own laboratory environment.

To see for yourself, place any other company's 20µl filter tip on a 200µl pipettor and deliberately draw 200µl of water against the filter (you can mix a little dye in to help you see). Did the water pass through the filter? If it did, so will aerosols. Now try the same test with an ART 20P. What are the results? If you need an ART 20P, visit our website at www.mbpinc.com; we will be happy to send you some. You may also view a video demonstration at www.mbpinc.com.

This is the reason that institutions around the globe have specified the ART tip in their protocols – ART tips work, every time, without fail. But, there is more. Blocking contamination from sample to pipettor is not enough; the tip cannot be a source of contamination either. It was Molecular BioProducts that pioneered the transformation of pipet tips from a low-end, contamination-ridden consumable to a clean, immaculately certified tool for use in the most sophisticated scientific applications the world has ever seen. Over the last 12 years this was accomplished by the development of now commonplace protocols such as independent laboratory certification for the absence of DNA, RNase, DNase, ATP, and pyrogen contamination, as well as, tests for the inhibition of PCR and validations of sterility levels. However, we did not stop there; our mission of continuous product improvement transcends these quality checks and encompasses every aspect of our operation.

This diagram shows the difference between ART self-sealing barrier tips and ordinary filter tips. ART barriers prevent cross-contamination while contaminants pass freely through ordinary filters.



Our QC & QA staff monitors all avenues of production from the inspection of incoming resins to the molded product headed for assembly and packaging. Prior to certification, each lot of ART tips undergoes 13 inspection points on 25 parameters; only then is it released, packaged, and sent to our quarantined holding area where samples are taken for final certification at an independent testing laboratory using standard statistical procedures. Only at this point is an ART tip ready for shipping, and that is why we stand behind our product with a 100% money-back guarantee – you will be completely satisfied with these products.

PURE

"Pure" is our certification that the products you are using are subject to the industry's highest standards of quality at every level of production. From raw materials to the finished product, all components of each manufacturing lot are fully traceable and produced in a controlled environment.

Molecular BioProducts guarantees all ART products meet the industry's highest standards for molding precision, clarity, and are certified free of RNase, DNase, ATP, and Pyrogens by an independent laboratory.

And yet, there is more: One of the reasons that ART is the premier brand of pipet tips is that it undergoes constant updating and improvement in order to meet your changing needs. Unlike most companies who offer only six or seven different filter tips, MBP offers scientists over 37 different barrier tip styles in three different packaging configurations and two polymer styles. This means that we have a tip for any pipettor and application, whether you are working with radioactive compounds, viscous material, fragile cell lines, whole blood, viruses, or difficult proteins – we have your application covered.

In this catalog you will find many new product features that have recently been added to the line: our proprietary Low Retention Polymer which will increase your pipetting accuracy and reduce non-specific binding is now available in our most popular ART tips (see page 16). You will also find new Ergonomic Pipet Tips for your Rainin, Gilson and Thermo-Labsystem pipettors that will significantly reduce the chance of sustaining Cumulative Trauma Disorder while working in your lab (see page 12).

It is innovations such as these and our ongoing commitment to be the best in liquid handling that cause researchers the world over to choose ART tips above all others. But, don't just take our word for it; try our product for FREE, or ask your colleagues - chances are they have been using ART tips for years. For validation samples, simply visit our website at www.mbpinc.com, and request any sample you require.

ART Barrier

Place any other company's 20µl filter tip on a 200µl pipettor and deliberately draw 200µl of water against the filter (you can mix a little dye in to help you see). Did the water pass through the filter? If it did, so will aerosols.

ART self-sealing barrier tips block contamination

WHILE...
Ordinary filters allow contamination to pass through

ART barrier | Ordinary Filters

Packaging Options

1. **Racked**
   (96 tips per tray,10 trays per pack)

2. **Individually Wrapped**
   (500 pre-sterilized, individually wrapped tips in a free-standing zip-locked bag)

3. **Bulk**
   (1000 loose tips in a free-standing zip-locked bag)

A

B

C

D

Micro Tips

Many of our low-volume tips are available with our MicroPoint design. This design minimizes surface area around the tip's orifice, reducing surface tension and allowing the most accurate dispense possible - a must when dispensing less than 2µl.

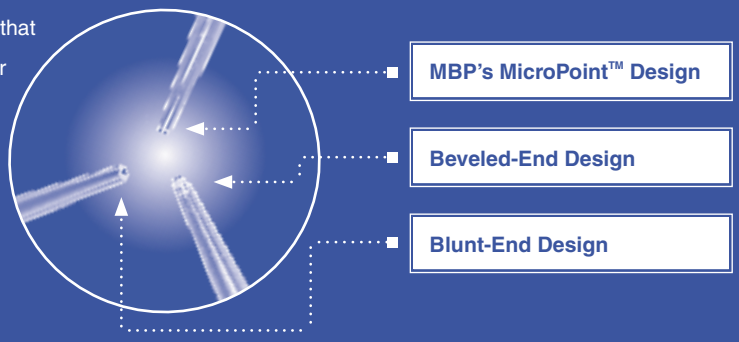
VOLUME 10µL STANDARD ART TIPS

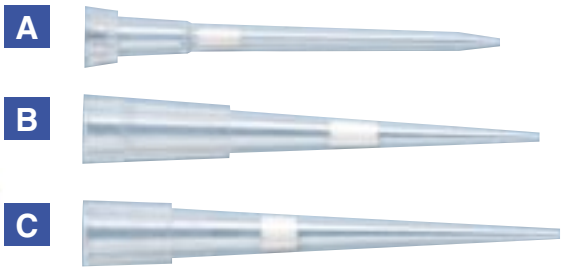
	Catalog Number	Product	Description	Unit Packaging
A	2139	ART 10	10µl MicroPoint Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2139B	ART 10	10µl MicroPoint Tip w/ART barrier	Bulk, non-sterile, 1000 tips/bag
B	2140	ART 10 Reach	10µl Extended Length Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2140B	ART 10 Reach	10µl Extended Length Tip w/ART barrier MicroPoint Design	Bulk, non-sterile, 1000 tips/bag
	2140IW	ART 10 Reach	10µl Extended Length Tip w/ART barrier MicroPoint Design	Individually wrapped, pre-sterilized, 500 tips/pack
C	2139F	ART 10F	10µl MicroPoint Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
D	2149E	ART 20E	10µl Ultra-micro Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2149EB	ART 20E	10µl Ultra-micro Tip w/ART barrier	Bulk, non-sterile, 1000 tips/bag

For pipettor tip fit information see appendix page 130

MICROPOINT

MBP's MicroPoint design means that the tip profile is nearly 50% smaller than standard blunt-end pipet tips and significantly more narrow than beveled-end tips. This increases precision, especially when working with low volume samples. The Micro-Point style tips are superior.





new for Multi-Channel

Patented Technology

ART tips use our patented self-sealing barrier that seals when exposed to aerosol and liquid contaminants, thus trapping them inside the barrier. This is the ONLY barrier tip on the market that gives you 100% protection against carryover contamination.

VOLUME 20µL TO 50µL STANDARD ART TIPS

	Catalog Number	Product	Description	Unit Packaging
A	2149	ART 20	20µl Pipet Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
B	2149P	ART 20P	20µl Pipet Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
new Reload System	2149P-50	ART 20P	20µl Pipet Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/Insert, 10 Inserts/pack
	2149PB	ART 20P	20µl Pipet Tip w/ART barrier MicroPoint Design	Bulk, non-sterile, 1000 tips/bag
	2149PIW	ART 20P	20µl Pipet Tip w/ART barrier MicroPoint Design	Individually wrapped, pre-sterilized, 500 tips/pack
C	2780	ART 50U	50µl Pipet Tip w/ART barrier SoftFit for Multi-Channel	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack

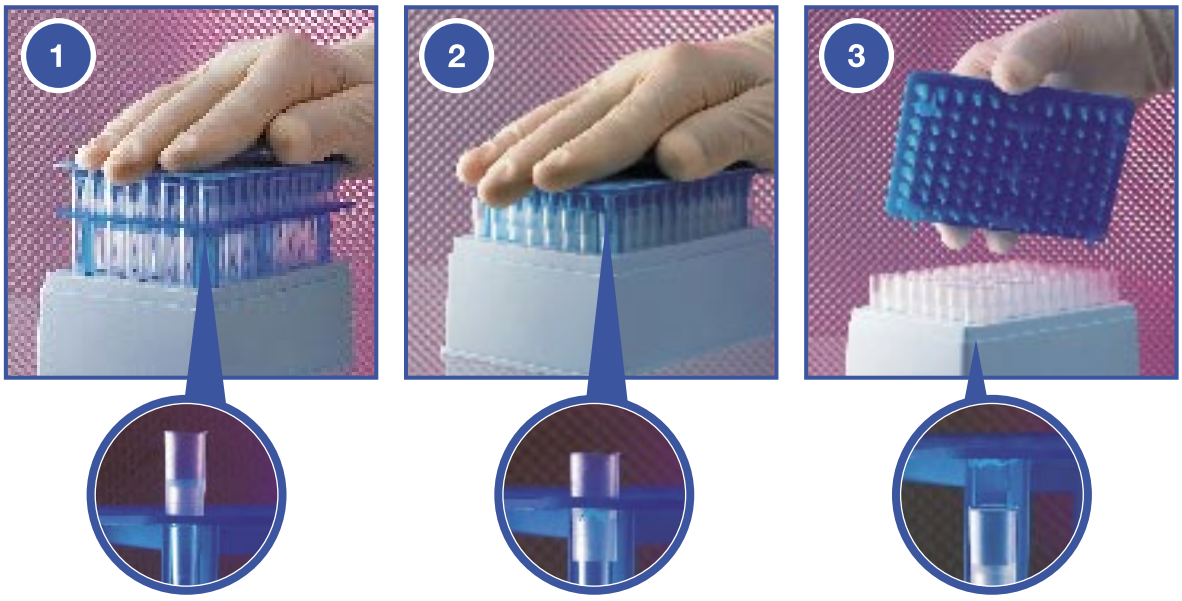
For pipettor tip fit information see appendix page 130

Breakthru Packaging Reload System

Pipet tip as it sits in transfer tray

Pipet tip breaking through transfer tray

Pipet tip fully through transfer tray and loaded into empty rack



• Universal to all 8x12 pipet tip trays • Available with or without the ART® self-sealing barrier • No snaps, buttons or machines needed • Uses 85% less packaging and 53% less space • Recyclable packaging

A

B

VOLUME 100µL STANDARD ART TIPS

	Catalog Number	Product	Description	Unit Packaging
A	2065	ART 100	100µl Pipet Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2065B	ART 100	100µl Pipet Tip w/ART barrier MicroPoint Design	Bulk, non-sterile 1000 tips/bag
B	2065E	ART 100E	100µl Pipet Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2065EB	ART 100E	100µl Pipet Tip w/ART barrier MicroPoint Design	Bulk, non-sterile 1000 tips/bag

For pipettor tip fit information see appendix page 130

C

D

new for Multi-Channel

VOLUME 200µL STANDARD ART TIPS

	Catalog Number	Product	Description	Unit Packaging
C	2069	ART 200	200µl Pipet Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2069B	ART 200	200µl Pipet Tip w/ART barrier MicroPoint Design	Bulk, non-sterile, 1000 tips/bag
	2069IW	ART 200	200µl Pipet Tip w/ART barrier MicroPoint Design	Individually wrapped, pre-sterilized, 500 tips/pack
D	2770	ART 200U	200µl Pipet Tip w/ART barrier SoftFit for Multi-Channel	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack

For pipettor tip fit information see appendix page 130

E

VOLUME 300µL STANDARD ART TIPS

	Catalog Number	Product	Description	Unit Packaging
E	2070	ART 300	300µl Pipet Tip w/ART barrier MicroPoint design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2070B	ART 300	300µl Pipet Tip w/ART barrier MicroPoint design	Bulk, non-sterile, 1000 tips/bag

For pipettor tip fit information see appendix page 130

A

B

C

VOLUME 1000µL STANDARD ART TIPS

	Catalog Number	Product	Description	Unit Packaging
A	2279	ART 1000	1000µl Pipet Tip w/ART barrier SoftFit Design	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	2279B	ART 1000	1000µl Pipet Tip w/ART barrier SoftFit Design	Bulk, non-sterile, 1000 tips/bag
	2279IW	ART 1000	1000µl Pipet Tip w/ART barrier SoftFit Design	Individually wrapped, pre-sterilized, 500 tips/pack
B	2079E	ART 1000E	1000µl Pipet Tip w/ART barrier	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	2079EB	ART 1000E	1000µl Pipet Tip w/ART barrier	Bulk, non-sterile, 1000 tips/bag
	2079EIW	ART 1000E	1000µl Pipet Tip w/ART barrier	Individually wrapped, pre-sterilized, 500 tips/pack
C	2079	ART 1000 REACH	1000µl Extended Length Pipet Tip w/ART barrier	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack

For pipettor tip fit information see appendix page 130

D

E

VOLUME 1250µL STANDARD ART TIPS

	Catalog Number	Product	Description	Unit Packaging
D	2080	ART 1250	1250µl Extended Length Pipet Tip w/ART barrier SoftFit Design	Racked, pre-sterilized, 96 tips/tray, 8 trays/pack
	2080B	ART 1250	1250µl Extended Length Pipet Tip w/ART barrier SoftFit Design	Bulk, non-sterile, 1000 tips/bag
E	2090	ART 1200	1200µl Pipet Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 8 trays/pack
	2090B	ART 1200	1200µl Pipet Tip w/ART barrier	Bulk, non-sterile, 1000 tips/bag

For pipettor tip fit information see appendix 130

F

VOLUME 5000µL STANDARD ART TIPS

	Catalog Number	Product	Description	Unit Packaging
F	2180B	ART 5000	5ml Pipet Tip w/ART barrier	Bulk, pre-sterilized, 250 tips/bag

For pipettor tip fit information see appendix 130

ERGONOMIC ART PIPET TIPS

A recent change in our industry is the heightened awareness that prolonged use of manual pipettors can cause several ergonomic stresses. This includes the development of Cumulative Trauma Disorders (CTD), or Work Related Upper Limb Disorders (WRULD), and other musculoskeletal disorders where strong force is required in the pipetting motion.

Avoiding CTD and WRULD is inexpensive and straightforward. Good laboratory practices combined with well-designed, modern pipettors and pipet tips can substantially reduce the strain involved in pipetting.

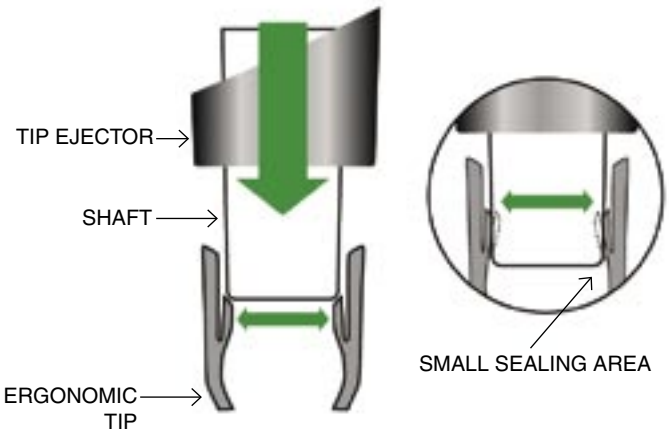
In this section you will find three new series of pipet tips for combating ergonomic injuries. We have recently introduced the SoftFit~L pipet tip for Rainin LTS pipetting systems. This is the only other tip available on the market for the Rainin Lite Touch Pipettors. As always, you will find that we have improved upon the original design, first by adding the ART barrier, and, secondly, by making this tip available in our proprietary Low Retention Polymer.

New to this section are products that you can truly become excited about. The following pages introduce our new line of ergo pipet tips. Molecular BioProducts has developed a unique bi-fabricated wall that allows you all the benefits of an ergonomic system without the need to purchase a set of expensive specialty pipettors.

Currently, these tips are available for the Gilson, Rainin LTS, Thermo Electron FinnPipet Digital, and FinnPipet Focus pipettors. You will be absolutely amazed by the performance of these pipet tips. Available with and without the ART Barrier and in our new Low Retention Polymer, visit our website to try these tips today.

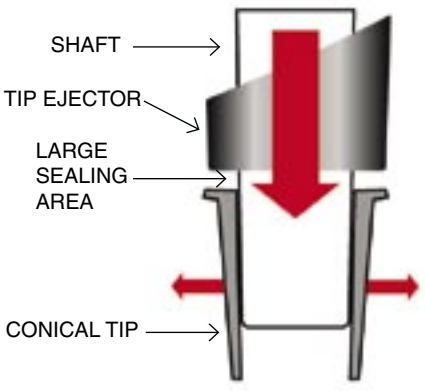
ART Brand Ergonomic Tip

The unique bi-fabricated wall of the ART Brand Ergonomic Tip creates a strong, effective seal while requiring significantly lower tip insertion and tip ejection force.



Standard Tip

Due to the high surface area of the pipet shaft in contact with the pipet tip, the amount of force to seat standard tips on the pipettor is significantly higher than with our Ergonomic style tips. The ejection force required to remove standard tips from the pipettor shaft is significantly higher as well, due to the slamming effect while seating the tip. Since standard tips are generally slammed on with more force than required, the same force is required to remove them.



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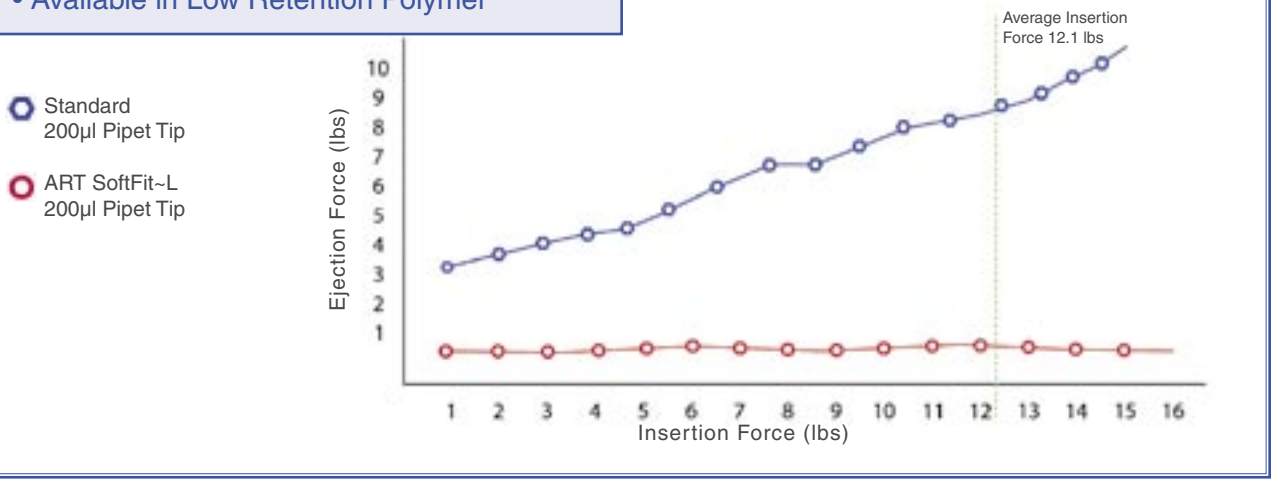
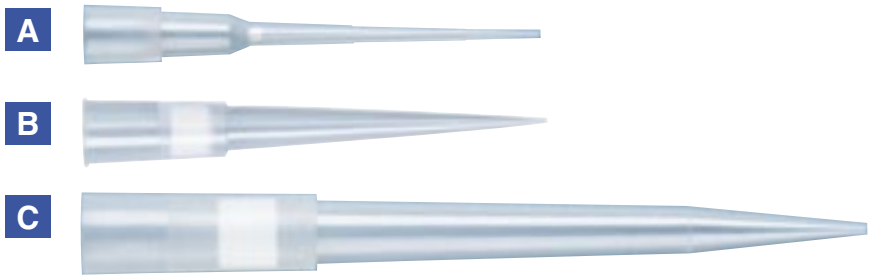
ART PIPET TIPS FOR LTS PIPETTORS

- Reduce Strains and Injury
- Secure and Consistent Seals
- Less Ejection Force
- Available in Low Retention Polymer

Comparison of Standard Pipet Tip Versus ART SoftFit~L





VOLUME 20µL TO 1000µL
ERGONOMIC ART PIPET TIPS FOR RAININ LTS

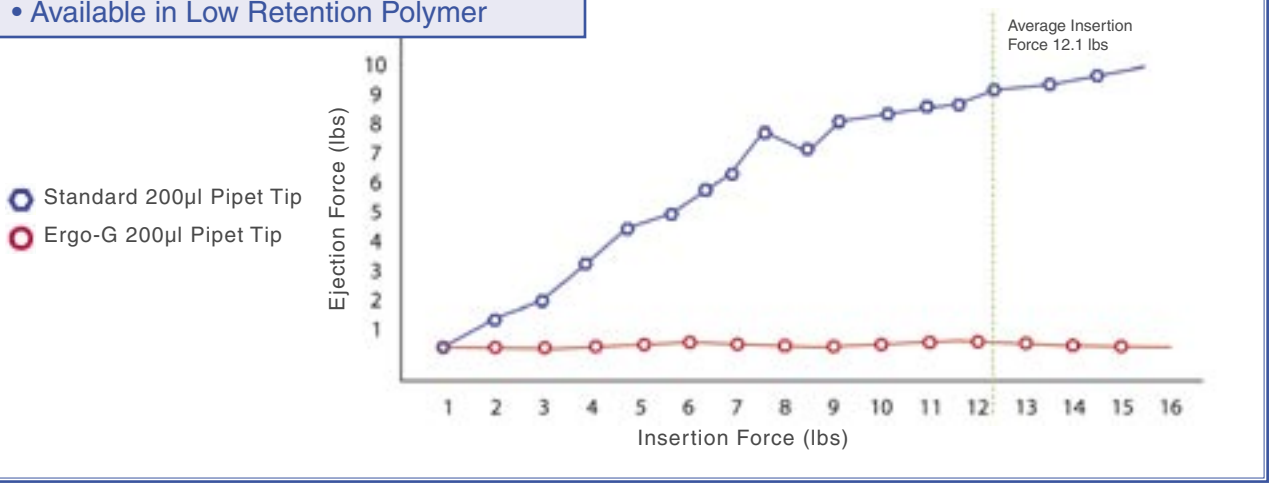
	Catalog Number	Product	Description	Unit Packaging
A	2749	ART 20L	20µl Ergonomic Pipet Tip w/ART barrier for Rainin LTS	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2749-05	ART 20L	20µl Ergonomic Low Retention Pipet Tip w/ART barrier for Rainin LTS	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
B	2769	ART 200L	200µl Ergonomic Pipet Tip w/ART barrier for Rainin LTS	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2769-05	ART 200L	200µl Ergonomic Low Retention Pipet Tip w/ART barrier for Rainin LTS	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
C	2779	ART 1000L	1ml Ergonomic Pipet Tip w/ART barrier for Rainin LTS	Racked, pre-sterilized, 96 tips/tray, 8 trays/pack
	2779-05	ART 1000L	1ml Ergonomic Low Retention Pipet Tip w/ART barrier for Rainin LTS	Racked, pre-sterilized, 96 tips/tray, 8 trays/pack

For pipettor tip fit information see appendix page 130

ERGONOMIC ART PIPET TIPS FOR GILSON PIPETMAN

- Reduce Strains and Injury
- Secure and Consistent Seals
- Less Ejection Force
- Available in Low Retention Polymer

Comparison of Standard Pipet Tip Versus ART Ergo-G



new for Pipetman

VOLUME 100µL TO 1000µL
ERGONOMIC ART PIPET TIPS FOR GILSON PIPETMAN

	Catalog Number	Product	Description	Unit Packaging
A	2320	ART 100 ERGO-G	100µl Ergonomic Pipet Tip w/ART barrier for Gilson Pipetman	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2320-05	ART 100 ERGO-G	100µl Ergonomic Low Retention Pipet Tip w/ART barrier for Gilson Pipetman	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
B	2330	ART 200 ERGO-G	200µl Ergonomic Pipet Tip w/ART barrier for Gilson Pipetman	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2330-05	ART 200 ERGO-G	200µl Ergonomic Low Retention Pipet Tip w/ART barrier for Gilson Pipetman	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
C	2340	ART 1000 ERGO-G	1000µl Ergonomic Pipet Tip w/ART barrier for Gilson Pipetman	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	2340-05	ART 1000 ERGO-G	1000µl Ergonomic Low Retention Pipet Tip w/ART barrier for Gilson Pipetman	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack

For pipettor tip fit information see appendix page 130

ART PIPET TIPS FOR FINNPIPETTE PIPETTORS

- Reduce Strains and Injury
- Secure and Consistent Seals
- Less Ejection Force
- Available in Low Retention Polymer

Comparison of Standard Pipet Tip Versus ART Ergo-F

new for FinnPipette

VOLUME 20µL TO 1000µL
ERGONOMIC ART PIPET TIPS FOR LABSYSTEMS FINNPIPETTE

	Catalog Number	Product	Description	Unit Packaging
A	2350	ART 20 ERGO-F	20µl Ergonomic Pipet Tip w/ART barrier for FinnPipette Focus and Digital pipettors	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2350-05	ART 20 ERGO-F	20µl Ergonomic Low Retention Pipet Tip w/ART barrier for FinnPipette Focus and Digital pipettors	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
B	2360	ART 100 ERGO-F	100µl Ergonomic Pipet Tip w/ART barrier for FinnPipette Focus and Digital pipettors	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2360-05	ART 100 ERGO-F	100µl Ergonomic Low Retention Pipet Tip w/ART barrier for FinnPipette Focus and Digital pipettors	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
C	2370	ART 200 ERGO-F	200µl Ergonomic Pipet Tip w/ART barrier for FinnPipette Focus and Digital pipettors	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2370-05	ART 200 ERGO-F	200µl Ergonomic Low Retention Pipet Tip w/ART barrier for FinnPipette Focus and Digital pipettors	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
D	2380	ART 1000 ERGO-F	1000µl Ergonomic Pipet Tip w/ART barrier for FinnPipette Focus and Digital pipettors	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	2380-05	ART 1000 ERGO-F	1000µl Ergonomic Low Retention Pipet Tip w/ART barrier for FinnPipette Focus and Digital pipettors	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack

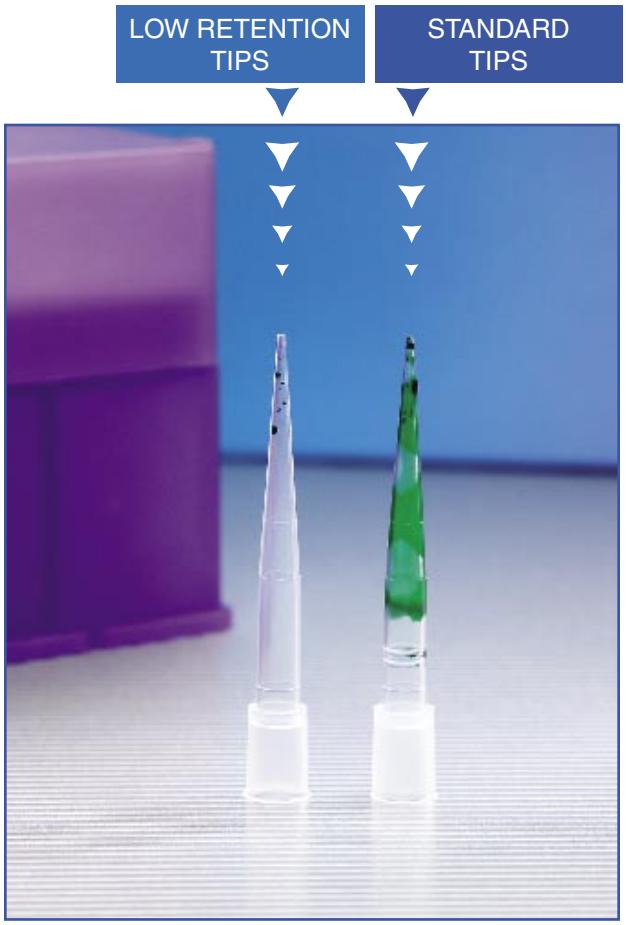
For pipettor tip fit information see appendix page 130

ART Low Retention

Low Retention pipet tips are specifically designed for applications requiring high accuracy and reproducibility. The delivery of highly viscous liquids is problematic because significant amounts of residual liquid typically remain in the pipet tip after the operation is completed. This systematic loss of sample contributes greatly to the variability in complex reactions such as PCR, RT PCR, and DNA sequencing.

Low Retention pipet tips reduce sample retention by three to five times when compared to an ordinary pipet tip. This new polymer technology makes the inner surface of the pipet tip more hydrophobic resulting in a significant reduction in sample loss due to adhesion. The result is less liquid retention and improved liquid handling. Visit our website at www.mbpinc.com to get your free sample today!

• Improves Sample Accuracy • Increased Reliability • Saves Expensive Reagents • Precise Sample Delivery
• Certified RNase, DNase, ATP, Endotoxin, and Pyrogen Free • MicroPoint & SoftFit Design • 100% Inert



◄ 200µl of green food dye was aspirated then dispensed using a tip featuring the proprietary Low Retention technology, as well as using a standard pipet tip. Notice the tip on the left has virtually no sample left behind, while the standard tip on the right has a considerable amount of your precious sample retained.

Table 1-1: Summary of HAV probe results*

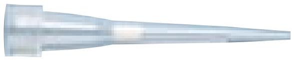
Values CPM is counts associated with tip after washing

	Diluted HAV probe	Diluted HAV probe
	Low Retention	Standard
Mean CPM	1451.3	3611.0
SD CPM	684.8	2336.4
% Total added	4.4	11.0

Stock HAV probe at @ 654289 CPM/ml

In Table 1-1 the Low Retention tips result in a much lower sample retention. They also demonstrated much more consistent retention leading to greater accuracy and precision. For more information, see technical report #221.

A



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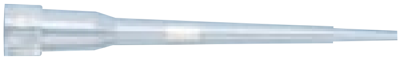

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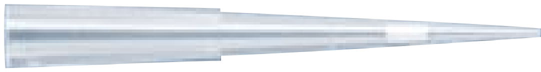

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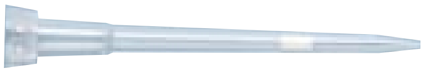
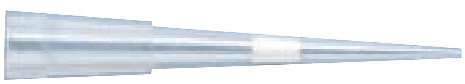


VOLUME 10µL LOW RETENTION ART TIPS-STANDARD FITS

	Catalog Number	Product	Description	Unit Packaging
A	2139-05	ART 10 Low Retention	10µl Micro Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
B	2140-05	ART 10 REACH Low Retention	10µl Extended Length Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
C	2139F-05	ART 10F Low Retention	10µl MicroPoint Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
D	2149E-05	ART 20E Low Retention	10µl Ultra-micro Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack

For pipettor tip fit information see appendix page 130

E



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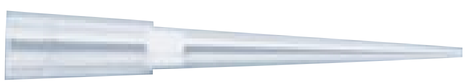
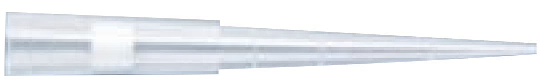
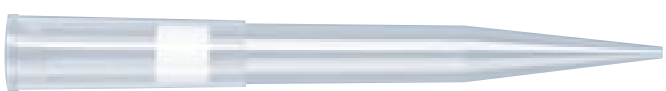


G



H



VOLUME 20µL TO 1000µL LOW RETENTION ART TIPS-STANDARD FITS

	Catalog Number	Product	Description	Unit Packaging
E	2149P-05	ART 20P Low Retention	20µl Pipet Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
F	2065E-05	ART 100E Low Retention	100µl Pipet Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
G	2069-05	ART 200 Low Retention	200µl Pipet Tip w/ART barrier MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
H	2279-05	ART 1000 Low Retention	1000µl Pipet Tip w/ART barrier SoftFit Design	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack

For pipettor tip fit information see appendix page 130

Gel Loading - Specialty Tips

Loading acrylamide or even agarose gels with standard pipet tips is an often time-consuming and frustrating process. Molecular BioProducts is one of only two tip companies in the world with the technology to produce tips specifically for this application. You will find our standard, round gel loading tips for agarose gels both here and in our HydroLogix tip section, as well as very specialized Ultra Round and Ultra Flat gel tips for your polyacrylamide gels. Available in six styles and three ODs, we have all your gel loading needs covered. Ask for your FREE sample today!

A

B

Specialty ART Tips for Gel Loading Volume 20µL to 100µL

	Catalog Number	Product	Description	Unit Packaging
A	2155P	ART Gel 20P	20µl Pipet Tip w/ART barrier Gel loading	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
B	2155	ART Gel 100	100µl Pipet Tip w/ART barrier Gel loading	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack

For pipettor tip fit information see appendix page 130

ART Barrier

Preserving the integrity of your PCR conditions and samples is essential, so it is important to select an aerosol-blocking tip based on its ability to perform as indicated. ART is the only interactive, self-sealing pipet tip available on the market today. It is the only tip that can provide you with 100% guaranteed protection against carryover and cross contamination. With regard to volume delivery, sample retention, sample retrievability, and carryover contamination protection, ART tips have been scientifically proven to provide accurate and consistent performance.

Pre-wet the Pipet Tip

Aspirate and dispense an amount of the sample liquid at least three times before aspirating a sample for delivery.

Evaporation within the tip can cause a significant loss of sample before delivery. Pre-wetting increases the humidity within the tip thus reducing both the amount of, and variation in, sample evaporation. Using the same tip (without pre-wetting) to deliver multiple samples results in lower volume for the first few samples.

Wide Bore - Specialty Tips

Our Wide Bore tips are perfect for working with genomic DNA, fragile cell lines and other viscous materials. With a distal end orifice nearly 70 percent larger than that of standard pipet tips they provide you the flexibility required for handling difficult-to-pipet samples. Available in 3 styles - try them today!

A 

B 

C 

VOLUME 200µL TO 1000µL
SPECIALTY ART TIPS, WIDE BORE GENOMIC

	Catalog Number	Product	Description	Unit Packaging
A	2069G	ART 200G	200µl Pipet Tip, Large Orifice w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
B	2160G	ART XLG	200µl Extended Length Pipet Tip, Large Orifice w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 8 trays/pack
	2160GIW	ART XLG	200µl Extended Length Pipet Tip, Large Orifice w/ART barrier	Individually wrapped, pre-sterilized, 500 tips/pack
C	2079G	ART 1000G	1000µl Pipet Tip, Large Orifice w/ART barrier	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	2079GB	ART 1000G	1000µl Pipet Tip, Large Orifice w/ART barrier	Bulk, non-sterile, 1000 tips/bag
	2079GIW	ART 1000G	1000µl Pipet Tip, Large Orifice w/ART barrier	Individually wrapped, pre-sterilized, 500 tips/pack

For pipettor tip fit information see appendix page 130

SELECTION

Whatever your application, whatever your packaging requirements, with over 90 different ART tips in this catalog, you can conduct your experiments with the confidence of knowing the world's best barrier tips are protecting you and your samples, and they are all here in this catalog.

• Sterile Racks • Reload Systems • Bulk • Individually Wrapped • Low Retention
• Ergonomic Systems

REACH - Specialty Tips

MBP's unique family of REACH pipet tips provide an extra level of contamination control. By significantly extending the length of the pipet tip, you may "reach" to the bottom of 0.5ml, 1.5ml, 2ml, 15ml, 50ml, and many other styles of culture tubes without fear of your pipettor coming in contact with the inside of your sample vessel. In conjunction with MBP's patented ART filter, you are assured of the best possible protection against carryover contamination. MBP's one-of-a kind REACH pipet tips add a layer of security in protecting both sample and pipettor by preventing the pipettor's shaft from touching the inside of the sample vessel, thus virtually eliminating the chance of carryover contamination, and the need to clean or replace pipettors.

- Available in four sizes.
- Extended tip length prevents contamination by keeping the pipettor shaft from entering the sample vessel.
- SoftFit design reduces hand fatigue and fits easily on most pipettors.
- Patented ART barrier will not allow aerosols or liquids to pass.
- 100% Protection against carryover contamination.
- MicroPoint design reduces surface area, which decreases sample retention.

ART 10 REACH™

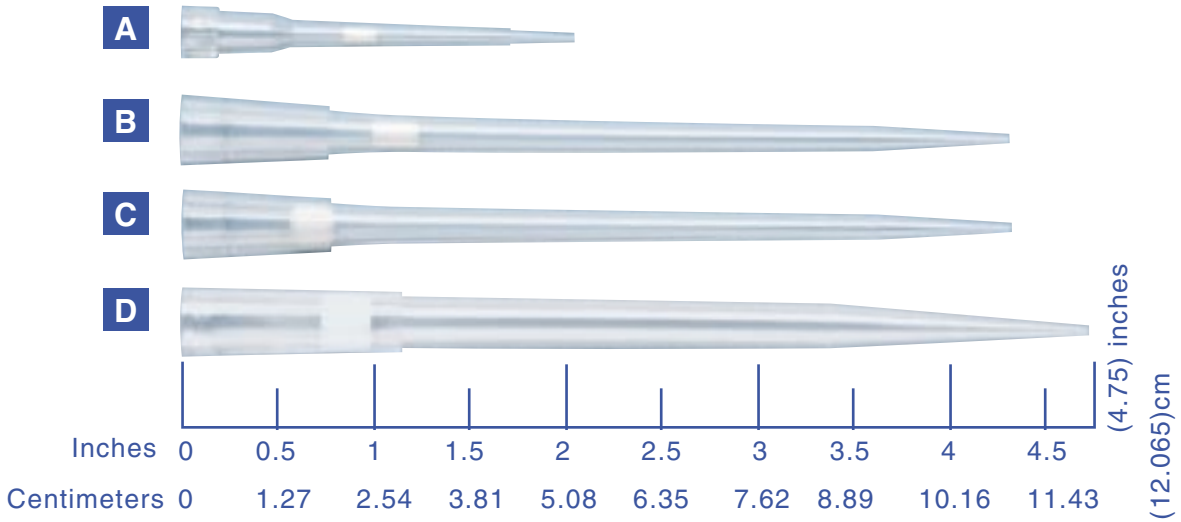
The extended length of the ART 10 REACH prevents contamination of your samples, tubes and pipettors.

Standard 10µl Micro-tip

Ordinary tips can increase the risk of cross-contamination by letting your pipettors touch the walls of sample tubes and other vessels.

BEWARE

Do not trust your research to filter tips that utilize ordinary filter materials; the average size of a typical segment of DNA used in PCR is .0034 microns while the average pore size of ordinary filter tips range from 20 to 40 microns!



VOLUME 10µL TO 1000µL REACH TIPS

	Catalog Number	Product	Description	Unit Packaging
A	2140	ART 10 REACH	10µl Extended Length Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	2140B	ART 10 REACH	10µl Extended Length Tip w/ART barrier	Bulk, non-sterile, 1000 tips/bag
	2140IW	ART 10 REACH	10µl Extended Length Tip w/ART barrier	Individually wrapped, pre-sterilized, 500 tips/pack
B	2159P	ART XLP	180µl Extended Length Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 8 trays/pack
	2159PB	ART XLP	180µl Extended Length Tip w/ART barrier	Bulk, non-sterile, 1000 tips/bag
C	2160P	ART XLP 200	200µl Extended Length Tip w/ART barrier	Racked, pre-sterilized, 96 tips/tray, 8 trays/pack
D	2079	ART 1000 REACH	1000µl Extended Length Tip w/ART barrier	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack

For pipettor tip fit information see appendix page 130

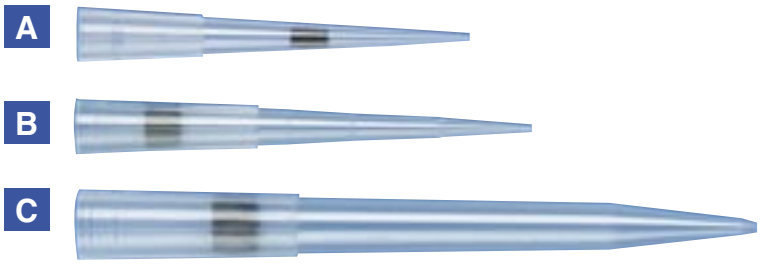
SolventSafe™ Carbon Filtered Pipet Tips for Acids, Bases and Aggressive Organic Solvents.

TIPS FOR COMBINATORIAL CHEMISTRY

Need to handle the pipetting rigors of Combinatorial Chemistry? Are strong acids, bases and aggressive organic solvents causing pipetting failures and critical inaccuracies? These cost you time, product loss, precious funds for lengthy pipettor repairs and calibration. Well, stop "borrowing" your bench mate's newly repaired and calibrated pipettor because Molecular BioProducts has developed the only solution for your demanding solvent needs. Manufactured by the leader in contamination control, MBP is proud to offer SolventSafe tips. SolventSafe offers a new formula of the Patented ART (aerosol resistant tip) Filter Tip. Our revolutionary use of the ART filter with Folded Activated Carbon offers both pipettor and sample protection against destructive carryover aerosols and vapors from volatile organic solvents, all without compromising pipetting accuracy and precision.

SolventSafe's proprietary blend of Folded Activated Carbon with a 40-micron polyethylene filter was put through two experiments to demonstrate the effective protection of this revolutionary filter material.

See "experiment results and Measurement of Gas Phase Volatile Organics by GCMS after passage through standard and SOLVENT SAFE carbon filter pipet tips" on our website at www.mbpinc.com



VOLUME 20µL TO 1000µL SolventSafe Pipet Tips

	Catalog Number	Product	Description	Unit Packaging
A	5449P	ART SolventSafe 20P	20µl Pipet Tip w/Carbon Filter MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 4 trays/pack
B	5469	ART SolventSafe 200	200µl Pipet Tip w/Carbon Filter MicroPoint Design	Racked, pre-sterilized, 96 tips/tray, 4 trays/pack
C	5479E	ART SolventSafe 1000E	1000µl Pipet Tip w/Carbon Filter MicroPoint Design	Racked, pre-sterilized, 100 tips/tray, 4 trays/pack

For pipettor tip fit information see appendix page 130

"Quote me as saying I was misquoted."

Groucho Marx

1.800.995.2787 | 1.858.453.7551 | INFO@MBPINC.COM

HydroLogix Brand Tips

MBP • SECTION 02

Index		Product	Page
1		HydroLogix Brand Tips	28
2		Ergonomic tips	33
	a.	Rainin LTS	34
	b.	Gilson Pipetman	35
	c.	Thermo LabSystems FinnPipette	36
3		Low Retention	37
4		Specialty tips	
	a.	Gel Loading	39
	b.	REACH	41
	c.	Wide Bore	42
	d.	Titertek, Matrix and Biohit	43
5		HLT Pipettor Fits Chart	137

Why researchers choose HydroLogix Brand Pipet Tips

BUILDING A NEW BRAND

This section of our catalog presents a new brand of pipet tips to the life science community. It is the combination and improvement of two different lines of pipet tips, and represents the most extensive and complete offering available today. Many people have asked us why, and indeed how, we came to choose the name HydroLogix to represent our new range of pipet tips.

The truth of the matter is, we did not come up with the name – one of our customers did. She explained that the word "hydrologic" was a direct reference to the circulation and conservation of the earth's water. Since water is the essential requirement for all life on earth and the goal of life science is to improve life through understanding gained by logical, methodical research, the name HydroLogix most closely fit the purpose for which our products are used. In addition, the movement of all aqueous based solutions in the lab is indeed part of the hydrologic cycle- sounded great to us!

You will find that we now offer a tip to fit virtually any pipettor in your laboratory. You may choose among standard yellow and blues, thin walled, beveled, micropoint, wide bore, gel loading, specialty, and REACH style tips all available in your choice of standard and high performance polymers. These new high performance polymers will increase your level of accuracy and precision as well as reduce non-specific binding. You will also discover a new series of tips dubbed Ergo. Ergo pipet tips are designed to provide you with all of the benefits of ergonomic pipetting systems at a fraction of the cost since no new pipettor is needed.

1.800.995.2787 | 1.858.453.7551 | INFO@MBPINC.COM

We have also added new packaging configurations designed to reduce laboratory waste and increase the availability of bench space. Look for new tips specifically designed to optimize your Gilson, FinnPipet, Eppendorf, Matrix, Titertek, MLA and Biohit pipettors. We believe that you will be very pleased with the choices available to you and with the assurance that the exact same manufacturing standards applied to the ART and BioRobotix product lines are now being applied to your general-use HLT pipet tips. As always, MBP guarantees its products to be 100% free of any manufacturing defects and invites you to try them for free. Simply log onto our website at www.mbpinc.com and order your validation samples today.

HYDROLOGIX

Packaging Options

1. Racked
(96 tips per tray,10 trays per pack)

2. Stack Racked
(96 tips per tray, 5 tray per stack, 2 stacks per pack)

3. Individually Wrapped
(500 pre-sterilized, individually wrapped tips in a free-standing zip-locked bag)

4. Bulk
(1000 loose tips in a free-standing zip-locked bag)

A

B

C

REDUCE CONTAMINATION RISK

All sterile HLT branded tips are certified "PURE". The lot testing protocols used in PURE certification are: DNA contamination, RNase and DNase Detection, Pyrogen Detection, Bioburden, PCR Inhibition, ATP Detection, and Sterility Verification. All non-sterile products are manufactured under clean room environments and are certified DNA, RNase and Dnase free. Our stringent manufacturing and QA/QC testing procedures assure you and your samples the most aseptic products on the market.

VOLUME 10µL STANDARD TIPS

	Catalog Number	Product	Description	Unit Packaging
A	3501	HLT 10	10µl Micro Tip, MicroPoint Design	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3502	HLT 10	10µl Micro Tip, MicroPoint Design	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3504	HLT 10	10µl Micro, Tip MicroPoint Design	Stack Rack, non-sterile 96 tips/tray, 2 stacks of 5 trays/pack
	3500	HLT 10	10µl Micro Tip, MicroPoint Design	Bulk, non-sterile 1000 tips/bag
B	3511	HLT 10 REACH	10µl Extended Length Tip, MicroPoint Design 2µl Reference Mark	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3512	HLT 10 REACH	10µl Extended Length Tip, MicroPoint Design 2µl Reference Mark	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3510	HLT 10 REACH	10µl Extended Length Tip,MicroPoint Design 2µl Reference Mark	Bulk, non-sterile 1000 tips/bag
C	3521	HLT Ultra Micro	20µl Ultra Micro Tip, MicroPoint Design	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3522	HLT Ultra Micro	20µl Ultra Micro Tip, MicroPoint Design	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3520	HLT Ultra Micro	20µl Ultra Micro Tip, MicroPoint Design	Bulk, non-sterile 1000 tips/bag

For pipettor tip fits information see appendix page 137

D

E

VOLUME 200µL STANDARD TIPS

	Catalog Number	Product	Description	Unit Packaging
D	3901	HLT Yellow	200µl Pipet Tip, Yellow	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	3902	HLT Yellow	200µl Pipet Tip, Yellow	Racked, non-sterile, 96 tips/tray, 10 trays/pack
	3904	HLT Yellow	200µl Pipet Tip, Yellow	Stack Rack, non-sterile, 96 tips/tray 2 stacks of 5 trays/pack
	3900	HLT Yellow	200µl Pipet Tip, Yellow	Bulk, non-sterile, 1000 tips/bag
E	3911	HLT 200	200µl Pipet Tip, Clear	Racked, pre-sterilized, 96 tips/tray, 10 trays/pack
	3912	HLT 200	200µl Pipet Tip, Clear	Racked, non-sterile, 96 tips/tray, 10 trays/pack
	3910	HLT 200	200µl Pipet Tip, Clear	Bulk, non-sterile, 1000 tips/bag

For pipettor tip fits information see appendix page 137

A 

B 

C 

D 

E 

REFERENCE MARKS

Many of our tips are molded with reference marks. They provide a quick and convenient guide to visually establish whether you are pipeting the desired volume of liquid.

VOLUME 200µL STANDARD TIPS

	Catalog Number	Product	Description	Unit Packaging
A	3921	HLT Yellow	200µl Pipet Tip, Beveled, Yellow	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3922	HLT Yellow	200µl Pipet Tip, Beveled, Yellow	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3920	HLT Yellow	200µl Pipet Tip, Beveled, Yellow	Bulk, non-sterile, 1000 tips/bag
B	3931	HLT 200	200µl Pipet Tip, Clear, Beveled Graduations at 10, 50 & 100µl	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3932	HLT 200	200µl Pipet Tip, Clear, Beveled Graduations at 10, 50 & 100µl	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3934	HLT 200	200µl Pipet Tip, Clear, Beveled Graduations at 10, 50 & 100µl	Stack Rack, non-sterile 96 tips/tray, 2 stacks of 5 trays/pack
	3930	HLT 200	200µl Pipet Tip, Clear, Beveled Graduations at 10, 50 & 100µl	Bulk, non-sterile, 1000 tips/bag
C	3941	HLT Yellow	200µl Pipet Tip, Yellow Eppendorf Style	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3942	HLT Yellow	200µl Pipet Tip, Yellow Eppendorf Style	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3940	HLT Yellow	200µl Pipet Tip, Yellow Eppendorf Style	Bulk, non-sterile, 1000 tips/bag
D	3961	HLT Yellow 200	200µl Pipet Tip, Thin Wall, Yellow	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3962	HLT Yellow 200	200µl Pipet Tip, Thin Wall, Yellow	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3960	HLT Yellow 200	200µl Pipet Tip, Thin Wall, Yellow	Bulk, non-sterile, 1000 tips/bag
E	3551	HLT 200	200µl Pipet Tip, Thin Wall, Clear	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3552	HLT 200	200µl Pipet Tip, Thin Wall, Clear	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3554	HLT 200	200µl Pipet Tip, Thin Wall, Clear	Stack Rack, non-sterile 96 tips/tray, 2 stacks of 5 trays/pack
	3550	HLT 200	200µl Pipet Tip, Thin Wall, Clear	Bulk, non-sterile, 1000 tips/bag

For pipettor tip fits information see appendix page 137

MULTI-CHANNEL PIPETTING

SoftFit™ tips provide unequaled tip-to-tip precision and consistent loading while multichannel pipeting. The design of the tips and reinforced wide bottom tray combine to eliminate the common problems of the tips falling off, uneven aspiration, and difficult tip loading when multi-channel pipeting. The SoftFit™ feature allows the tips to conform to the pipettor barrel without exerting additional force. This ensures a leak-proof seal and reliable attachment and state of the art precision, while reducing hand fatigue during loading and ejecting.

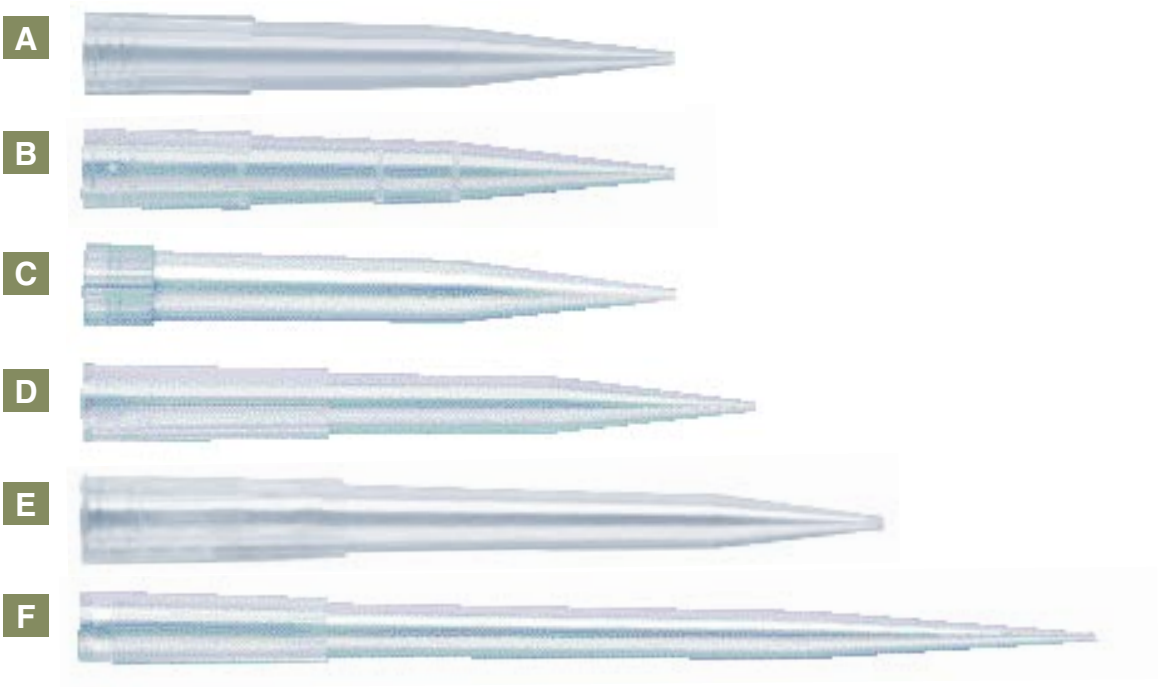
A

B

VOLUME 300µL MULTI-CHANNEL TIPS

	Catalog Number	Product	Description	Unit Packaging
A	3771	HLT 300U	300µl Pipet Tip, SoftFit	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3772	HLT 300U	300µl Pipet Tip, SoftFit	Racked, non-sterile 96 tips/tray, 10 trays/pack
B	3571	HLT Titertek 300	300µl Pipet Tip Graduations at 10, 50, 100 & 200µl	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3572	HLT Titertek 300	300µl Pipet Tip Graduations at 10, 50, 100 & 200µl	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3570	HLT Titertek 300	300µl Pipet Tip Graduations at 10, 50, 100 & 200µl	Bulk, non-sterile, 1000 tips/bag

For pipettor tip fits information see appendix page 137



VOLUME 1000µL STANDARD TIPS

	Catalog Number	Product	Description	Unit Packaging
A	3951	HLT Blue	1000µl Pipet Tip, Blue	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	3952	HLT Blue	1000µl Pipet Tip, Blue	Racked, non-sterile, 100 tips/tray, 8 trays/pack
	3954	HLT Blue	1000µl Pipet Tip, Blue	Stack Rack, non-sterile, 100 tips/tray 2 stacks of 5 trays/pack
	3950	HLT Blue	1000µl Pipet Tip, Blue	Bulk, non-sterile, 1000 tips/bag
B	3981	HLT 1000	1000µl Pipet Tip, Clear Graduations at 250, 500 &1000µl	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	3982	HLT 1000	1000µl Pipet Tip, Clear Graduations at 250, 500 &1000µl	Racked, non-sterile 100 tips/tray, 8 trays/pack
	3984	HLT 1000	1000µl Pipet Tip, Clear Graduations at 250, 500 &1000µl	Stack Rack, non-sterile, 100 tips/tray 2 stacks of 5 trays/pack
	3980	HLT 1000	1000µl Pipet Tip, Clear Graduations at 250, 500 &1000µl	Bulk, non-sterile, 1000 tips/bag
C	3991	HLT Blue	1000µl Pipet Tip, Eppendorf Style	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	3992	HLT Blue	1000µl Pipet Tip, Eppendorf Style	Racked, non-sterile 100 tips/tray, 8 trays/pack
	3990	HLT Blue	1000µl Pipet Tip, Eppendorf Style	Bulk, non-sterile, 1000 tips/bag
D	3581	HLT 1000	1000µl Pipet Tip, SoftFit Design	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	3582	HLT 1000	1000µl Pipet Tip, SoftFit Design	Racked, non-sterile, 100 tips/tray, 8 trays/pack
	3580	HLT 1000	1000µl Pipet Tip, SoftFit Design	Bulk, non-sterile, 1000 tips/bag
E	3881	HLT 1000E	1000µl Pipet Tip, Clear	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	3882	HLT 1000E	1000µl Pipet Tip, Clear	Racked, non-sterile, 100 tips/tray, 8 trays/pack
	3880	HLT 1000E	1000µl Pipet Tip, Clear	Bulk, non-sterile, 1000 tips/bag
F	3791	HLT 1000 REACH	1000µl Extended Length Tip SoftFit Design	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	3792	HLT 1000 REACH	1000µl Extended Length Tip SoftFit Design	Racked, non-sterile, 100 tips/tray, 8 trays/pack

For pipettor tip fits information see appendix page 137

A

B

C

VOLUME 5000µL STANDARD TIPS

	Catalog Number	Product	Description	Unit Packaging
A	3895	HLT 5000	5000µl Pipet Tip, Clear, BluntPoint	Bulk, non-sterile, 250 tips/bag
B	3896	HLT 5000	5000µl Pipet Tip, Clear, MicroPoint	Bulk, non-sterile, 250 tips/bag
C	3897	HLT 5000	5000µl Pipet Tip, Clear	Bulk, non-sterile, 250 tips/bag

For pipettor tip fits information see appendix page 137

D

VOLUME 10000µL STANDARD TIPS

	Catalog Number	Product	Description	Unit Packaging
D	3898	HLT 10ML	10000µl Pipet Tip, Clear, Graduations at 1000µl intervals	Bulk, non-sterile, 200 tips/bag

For pipettor tip fits information see appendix page 137

HYDROLOGIX BRAND PCR TUBES

Reduced Sample Evaporation

If you like our tips, try our HLT Tubes. All HydroLogix tubes feature secure sealing caps to minimize sample evaporation during thermal cycling. Our caps close tightly and do not open until you want them to.

Compatibility

All HydroLogix tubes are compatible with major brand thermocyclers: MJ Research, Eppendorf, BioRad, PerkinElmer and Stratagene, to name a few.

See page 71 for more information.

ERGONOMIC PIPET TIPS

With the increased use of pipettors and pipet tips, there has been a marked increase in the awareness of the risks of ergonomic disorders that can be associated with repetitive pipetting.

Prolonged use of manual pipettors can cause several ergonomic stresses. This includes the development of Cumulative Trauma Disorders (CTD) or Work Related Upper Limb Disorders (WRULD) and other musculoskeletal disorders where strong force is required in the pipetting motion.

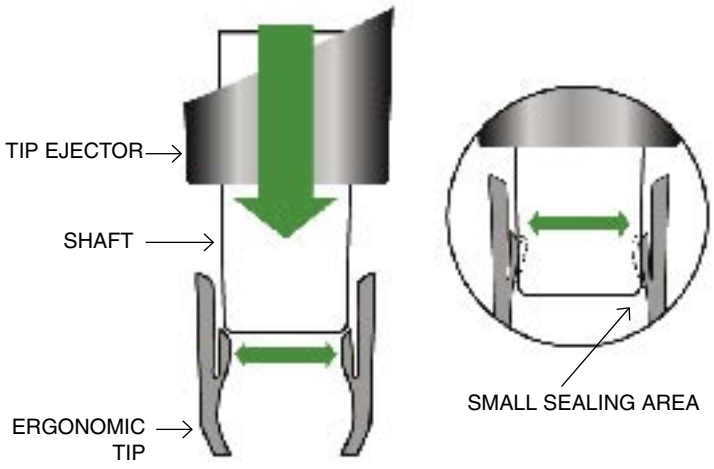
Avoiding CTD and WRULD is inexpensive and straightforward. Good laboratory practices combined with well designed, modern pipettors and pipet tips can substantially reduce the strain involved in pipetting.

These new HydroLogix pipet tips utilize a unique bi-fabricated wall that has been designed to produce a secure seal at a fraction of the force required to load standard pipet tips onto your pipettor. Accordingly, the forces required to eject the tips from your pipettor are significantly reduced as well. These tips are available for Gilson, Rainin LTS, Thermo Electron FinnPipette Digital, and Focus Brands. Try them today!

• Reduced Strains and Injury • Secure and Consistent Seals • Less Ejection Force • Available in two pipettor Styles
• Available in Low Retention Polymer • Available with the ART Self Sealing Barrier

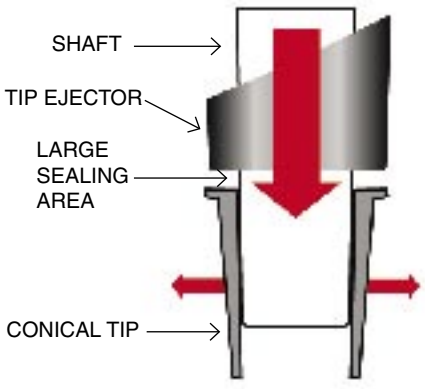
HydroLogix Brand Ergonomic Tip

The unique bi-fabricated wall of the HydroLogix Brand Ergonomic Tip creates a strong, effective seal while requiring significantly lower tip seating and ejection force.



Standard Tip

Due to the high surface area of the pipet shaft in contact with standard pipet tips, the amount of force to seat standard tip on the pipettor is significantly higher than with our Ergonomic style tips. Consequently, the ejection force required to remove standard tips from the pipettor shaft is significantly higher as well due to the slamming effect while seating the tip.



SOFTFIT-L FOR RAININ LTS LITETOUCH PIPETTORS

SoftFit~L pipet tips for Rainin LTS pipettors are cylindrical, rather than conical and produce a reliable, consistent seal without excessive force. SoftFit~L tips are thin-walled and incorporate a small, well-defined seal area with a positive stop. The positive stop lets you know when the seal is made and prevents over insertion of the pipettor shaft into the tip. There is no need to forcefully seat the tip on the pipettor, thus a reduction in force is achieved. This means ejection forces are reduced when compared to traditional conical tips and pipettors.

A

B

now available in Low Retention

C

VOLUME 20µL TO 1000µL ERGONOMIC TIPS

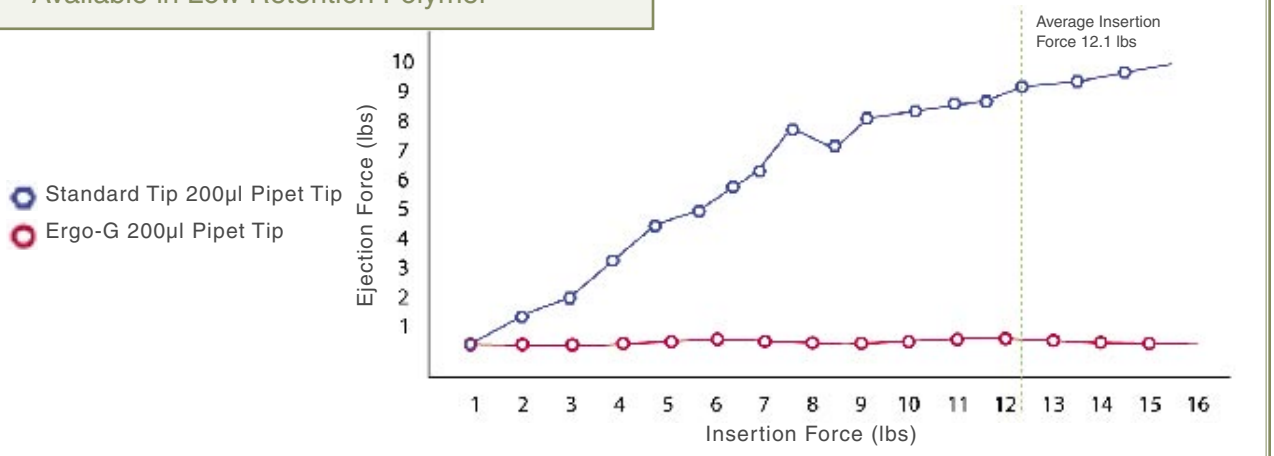
	Catalog Number	Product	Description	Unit Packaging
	SoftFit~L 20µl			
A	3721	HLT 20L	20µl SoftFit~L Pipet Tip, Reinforced Tray for Rainin LTS Pipettors	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3722	HLT 20L	20µl SoftFit~L Pipet Tip, Reinforced Tray for Rainin LTS Pipettors	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3721-05	HLT 20L	20µl SoftFit~L Pipet Tip, Reinforced Tray Low Retention, for Rainin LTS Pipettors	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3722-05	HLT 20L	20µl SoftFit~L Pipet Tip, Reinforced Tray Low Retention, for Rainin LTS Pipettors	Racked, non-sterile 96 tips/tray, 10 trays/pack
	SoftFit~L 200µl			
B	3751	HLT 200L	200µl SoftFit~L Pipet Tip, Reinforced Tray for Rainin LTS Pipettors	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3752	HLT 200L	200µl SoftFit~L Pipet Tip, Reinforced Tray for Rainin LTS Pipettors	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3751-05	HLT 200L	200µl SoftFit~L Pipet Tip, Reinforced Tray Low Retention, for Rainin LTS Pipettors	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3752-05	HLT 200L	200µl SoftFit~L Pipet Tip, Reinforced Tray Low Retention, for Rainin LTS Pipettors	Racked, non-sterile 96 tips/tray, 10 trays/pack
	SoftFit~L 1000µl			
C	3781	HLT 1000L	1000µl SoftFit~L Tip, Reinforced Tray for Rainin LTS Pipettors	Racked, pre-sterilized 96 tips/tray, 8 trays/pack
	3782	HLT 1000L	1000µl SoftFit~L Tip, Reinforced Tray for Rainin LTS Pipettors	Racked, non-sterile 96 tips/tray, 8 trays/pack
	3781-05	HLT 1000L	1000µl SoftFit~L Tip, Reinforced Tray Low Retention, for Rainin LTS Pipettors	Racked, pre-sterilized 96 tips/tray, 8 trays/pack
	3782-05	HLT 1000L	1000µl SoftFit~L Tip, Reinforced Tray Low Retention, for Rainin LTS Pipettors	Racked, non-sterile 96 tips/tray,8 trays/pack

For pipettor tip fits information see appendix page 137

HLT PIPET TIPS FOR GILSON PIPETMAN

- Reduce Strains and Injury
- Secure and Consistent Seals
- Less Ejection Force
- Available in Low Retention Polymer

Comparison of Standard Pipet Tip Versus HLT Ergo-G



A

B

available in Low Retention

VOLUME 200µL TO 1000µL ERGONOMIC TIPS

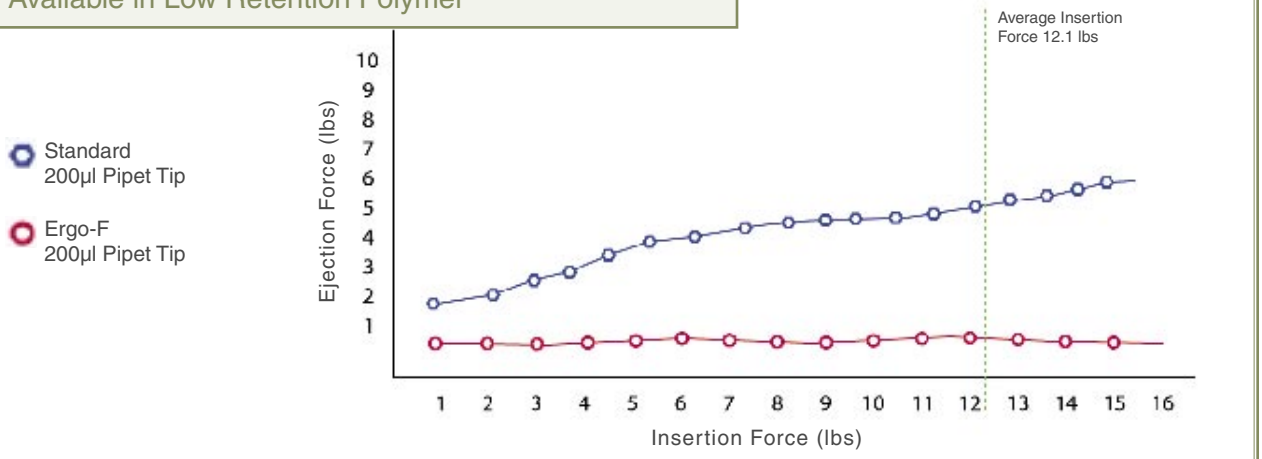
Catalog Number	Product	Description	Unit Packaging
Gilson Ergo-G 200µl			
A 3831	HLT 200 Ergo-G	200µl Pipet Tip, Ergonomic Design for Gilson Pipetman	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
3832	HLT 200 Ergo-G	200µl Pipet Tip, Ergonomic Design for Gilson Pipetman	Racked, non-sterile 96 tips/tray, 10 trays/pack
3831-05	HLT 200 Ergo-G	200µl Pipet Tip, Ergonomic Design Low Retention for Gilson Pipetman	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
3832-05	HLT 200 Ergo-G	200µl Pipet Tip, Ergonomic Design Low Retention for Gilson Pipetman	Racked, non-sterile 96 tips/tray, 10 trays/pack
Gilson Ergo-G 1000µl			
B 3841	HLT 1000 Ergo-G	1000µl Pipet Tip, Ergonomic Design for Gilson Pipetman	Racked, pre-sterilized 100 tips/tray, 8 trays/pack
3842	HLT 1000 Ergo-G	1000µl Pipet Tip, Ergonomic Design for Gilson Pipetman	Racked, non-sterile 100 tips/tray, 8 trays/pack
3841-05	HLT 1000 Ergo-G	1000µl Pipet Tip, Ergonomic Design Low Retention for Gilson Pipetman	Racked, pre-sterilized 100 tips/tray, 8 trays/pack
3842-05	HLT 1000 Ergo-G	1000µl Pipet Tip, Ergonomic Design Low Retention for Gilson Pipetman	Racked, non-sterile 100 tips/tray, 8 trays/pack

For pipettor tip fits information see appendix page 137

HLT PIPET TIPS FOR FINNPIPETTE PIPETTORS

- Reduce Strains and Injury
- Secure and Consistent Seals
- Less Ejection Force
- Available in Low Retention Polymer

Comparison of Standard Pipet Tip Versus HLT Ergo-F



A

B

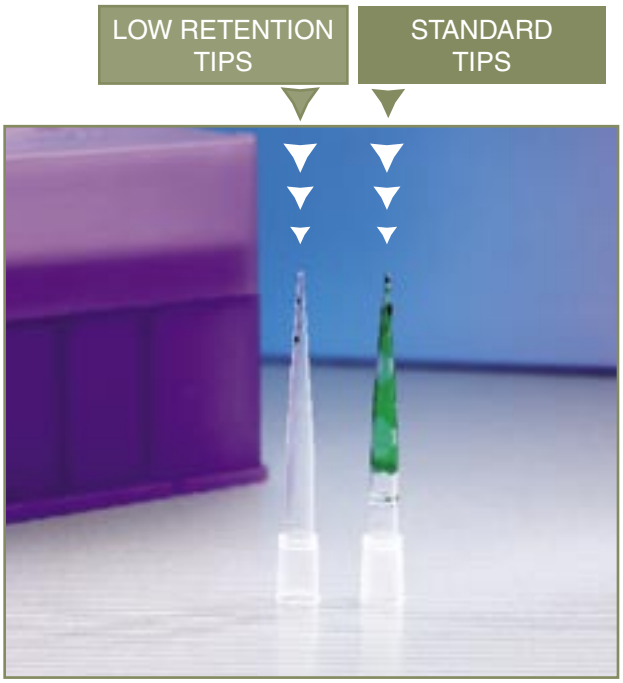
NOW
available in
Low Retention

VOLUME 200µL AND 1000µL ERGONOMIC TIPS

Catalog Number	Product	Description	Unit Packaging
ThermoLabsytems Ergo-F 200µl			
A 3811	HLT 200 Ergo-F	200µl Pipet Tip, Ergonomic Design for FinnPipette Focus & Digital Pipettors	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
3812	HLT 200 Ergo-F	200µl Pipet Tip, Ergonomic Design for FinnPipette Focus & Digital Pipettors	Racked, non-sterile 96 tips/tray, 10 trays/pack
3811-05	HLT 200 Ergo-F	200µl Pipet Tip, Ergonomic Design, Low Retention for FinnPipette Focus & Digital Pipettors	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
3812-05	HLT 200 Ergo-F	200µl Pipet Tip, Ergonomic Design, Low Retention for FinnPipette Focus & Digital Pipettors	Racked, non-sterile 96 tips/tray, 10 trays/pack
ThermoLabsytems Ergo-F 1000ul			
B 3821	HLT 1000 Ergo-F	1000µl Pipet Tip, Ergonomic Design for FinnPipette Focus & Digital Pipettors	Racked, pre-sterilized 100 tips/tray, 8 trays/pack
3822	HLT 1000 Ergo-F	1000µl Pipet Tip, Ergonomic Design for FinnPipette Focus & Digital Pipettors	Racked, non-sterile 100 tips/tray, 8 trays/pack
3821-05	HLT 1000 Ergo-F	1000µl Pipet Tip, Ergonomic Design, Low Retention for FinnPipette Focus & Digital Pipettors	Racked, pre-sterilized 100 tips/tray, 8 trays/pack
3822-05	HLT 1000 Ergo-F	1000µl Pipet Tip, Ergonomic Design, Low Retention for FinnPipette Focus & Digital Pipettors	Racked, non-sterile 100 tips/tray, 8 trays/pack

For pipettor tip fits information see appendix page 137

LOW SAMPLE RETENTION



HydroLogix tips are crystal clear and cast from special molds designed to reduce sample retention. The high quality, virgin polypropylene used to manufacture these tips also decreases sample retention without the use of additives or coatings that may negatively affect sample integrity.

Our new Low Retention Pipet Tips are specifically designed for applications requiring high accuracy and reproducibility. The delivery of highly viscous liquids is problematic because significant amounts of residual liquid typically remain in the pipet tip after the pipeting cycle is completed. This systematic loss of sample contributes greatly to the variability in complex reactions such as PCR, RT PCR, and DNA sequencing.

Low Retention pipet tips reduce sample retention by 3 to 5 times when compared to an ordinary pipet tip. This new polymer technology makes the inner surface of the pipet tip more hydrophobic resulting in a significant reduction in sample loss due to adhesion. The result is less liquid retention and improved liquid handling.

◀◀ **200µl** of green food dye was aspirated then dispensed using a tip featuring the proprietary Low Retention technology as well as using a standard pipet tip. Notice the tip on the left has virtually no sample left behind, while the standard tip on the right has a considerable amount of sample retained.

A 

B 

C 

VOLUME 10µL LOW RETENTION

	Catalog Number	Product	Description	Unit Packaging
A	3501-05	HLT 10	10µl Micro Tip, Low Retention MicroPoint Design	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3502-05	HLT 10	10µl Micro Tip, Low Retention MicroPoint Design	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3500-05	HLT 10	10µl Micro Tip, Low Retention MicroPoint Design	Bulk, non-sterile, 1000 tips/bag
B	3511-05	HLT 10 REACH	10µl Extended Length Tip, Low Retention MicroPoint Design	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3512-05	HLT 10 REACH	10µl Extended Length Tip, Low Retention MicroPoint Design	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3510-05	HLT 10 REACH	10µl Extended Length Tip, Low Retention MicroPoint Design	Bulk, non-sterile, 1000 tips/bag
C	3521-05	HLT Ultra Micro	20µl Ultra Micro Tip, Low Retention MicroPoint Design	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3522-05	HLT Ultra Micro	20µl Ultra Micro Tip, Low Retention MicroPoint Design	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3520-05	HLT Ultra Micro	20µl Ultra Micro Tip, Low Retention MicroPoint Design	Bulk, non-sterile, 1000 tips/bag

For pipettor tip fits information see appendix page 137

A

B

C

D

VOLUME 200µL LOW RETENTION

	Catalog Number	Product	Description	Unit Packaging
A	3931-05	HLT 200	200µl Pipet Tip, Clear, Graduated, reference marks at 10, 50 &100µl, Low Retention	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3932-05	HLT 200	200µl Pipet Tip, Clear, Graduated, reference marks at 10, 50 &100µl, Low Retention	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3930-05	HLT 200	200µl Pipet Tip, Clear, Graduated, reference marks at 10, 50 &100µl, Low Retention	Bulk, non-sterile, 1000 tips/bag
B	3941-05	HLT Yellow	200µl Pipet Tip, Eppendorf Style Low Retention, Yellow	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3942-05	HLT Yellow	200µl Pipet Tip, Eppendorf Style Low Retention, Yellow	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3940-05	HLT Yellow	200µl Pipet Tip, Eppendorf Style Low Retention, Yellow	Bulk, non-sterile, 1000 tips/bag
C	3551-05	HLT 250	250µl Pipet Tip, Thin Wall, Clear, Low Retention	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3552-05	HLT 250	250µl Pipet Tip, Thin Wall, Clear, Low Retention	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3550-05	HLT 250	250µl Pipet Tip, Thin Wall, Clear, Low Retention	Bulk, non-sterile, 1000 tips/bag
D	3771-05	HLT 300U	300µl Pipet Tip, Low Retention SoftFit	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3772-05	HLT 300U	300µl Pipet Tip, Low Retention SoftFit	Racked, non-sterile 96 tips/tray, 10 trays/pack

For pipettor tip fits information see appendix page 137

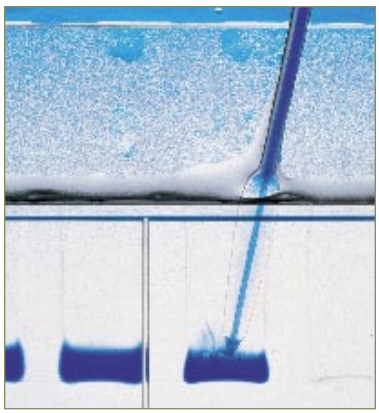
D

VOLUME 1000µL LOW RETENTION

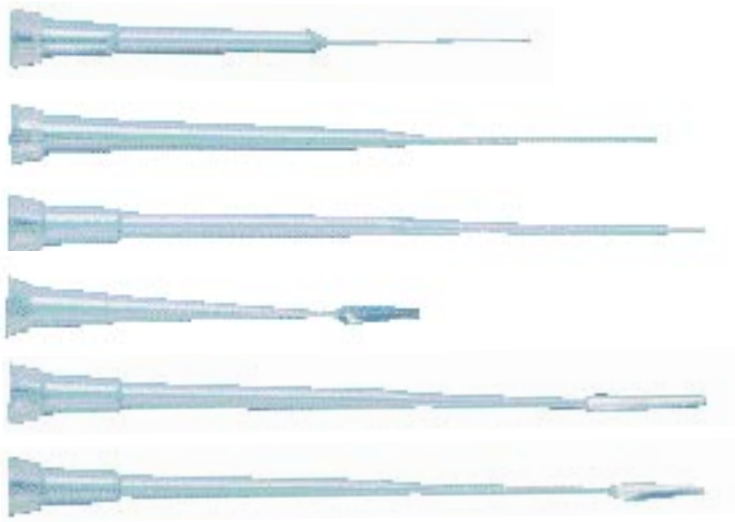
	Catalog Number	Product	Description	Unit Packaging
D	3581-05	HLT 1000	1000µl Pipet Tip, Clear,Low Retention SoftFit	Racked, pre-sterilized, 100 tips/tray, 8 trays/pack
	3582-05	HLT 1000	1000µl Pipet Tip, Clear,Low Retention SoftFit	Racked, non-sterile 100 tips/tray, 8 trays/pack

For pipettor tip fits information see appendix page 137

Gel Loading - Specialty Tips



Loading acrylamide or even agarose gels with standard pipet tips is an often time-consuming and frustrating process. Molecular BioProducts is one of only two tip companies in the world with the technology to produce tips specifically for this application. You will find our standard, round gel loading tips for agarose gels both here and in our ART tip section as well as very specialized Ultra Round and Ultra Flat gel tips for your polyacrylamide gels. Available in six styles and six ODs, we have all your gel loading needs covered. Ask for your FREE samples today!



	GEL THICKNESS	OD	ID	USE
A	for loading gels 0.4mm thick and thinner	.25mm .010in	.13mm .005in	Capillary Systems is what this tip is well suited for
B	for loading gels 0.6mm thick and thicker	.58mm .023in	.31mm .012in	Great for Agarose, 2-D & SDS PAGE, Proteins
C	for loading gels 0.6mm thick and thicker	.57mm .0224in	.38mm .015in	Great for Agarose, 2-D & SDS PAGE, Proteins
D	for loading gels 0.2mm thick and thinner	.17mm .0067in		Perfect fit for DNA sequencing gels
E	for loading gels 0.4mm thick and thinner	.37mm .0146in		Ideal for Polyacrylamide sequencing gels
F	for loading gels 0.2mm thick and thinner	.17mm .0067in		Perfect fit for DNA sequencing gels

VOLUME 10µL GEL TIPS

	Catalog Number	Product	Description	Unit Packaging
A	3652	HLT Ultra Micro Gel 10	10µl Round Gel Loading Pipet Tip, Ultra Micro Length 2-1/4"	Racked, pre-sterilized 204 tips/tray, 5 trays/pack
B	3653	HLT Gel 10	10µl Round Gel Loading Pipet Tip Length 2-13/16"	Racked, pre-sterilized 204 tips/tray, 8 trays/pack
C	3651	HLT Round Gel 10	10µl Round Gel Loading Pipet Tip	Racked, non-sterile 200 tips/tray, 1 tray/pack
D	3641	HLT Micro-Flat Gel 10	10µl Universal Flat Gel Loading Pipet Tip	Racked, non-sterile 200 tips/tray, 1 tray/pack
E	3661	HLT Flat Gel 10	10µl Flat Gel Loading Pipet Tip	Racked, non-sterile 200 tips/tray, 1 tray/pack
F	3671	HLT Ultra-Flat Gel 10	10µl Flat Loading Pipet Tip	Racked, non-sterile 200 tips/tray, 1 tray/pack

For pipettor tip fits information see appendix page 137

A

B

C

GEL THICKNESS	OD	ID	USE
for loading gels up to 0.6mm thick	.61mm .024in	.31mm .012in	Great for Agarose, 2-D & SDS PAGE, Proteins
for loading gels 0.6mm thick and thicker	.57mm .0224in	.38mm .015in	Great for Agarose, 2-D & SDS PAGE, Proteins
for loading gels up to 0.4mm thick	.37mm .0146in		Ideal for Polyacrylamide & DNA sequencing gels

VOLUME 200µL GEL TIPS

	Catalog Number	Product	Description	Unit Packaging
A	3691	HLT Round Gel 200	200µl Round Gel Loading Pipet Tip	Racked, pre-sterilized 204 tips/tray, 5 trays/pack
	3692	HLT Round Gel 200	200µl Round Gel Loading Pipet Tip	Racked, non-sterile 204 tips/tray, 5 trays/pack
	3690	HLT Round Gel 200	200µl Round Gel Loading Pipet Tip	Bulk, non-sterile, 1000 tips/bag
B	3621	HLT Round Gel 200	200µl Universal Round Gel Loading Pipet Tip 83mm in Length 5µl grad	Racked, non-sterile 200 tips/tray, 1 tray/pack
C	3631	HLT Flat Gel 200	200µl Universal Flat Gel Loading Pipet Tip 83mm in Length 5µl grad	Racked, non-sterile 200 tips/tray, 1 tray/pack

For pipettor tip fits information see appendix page 137

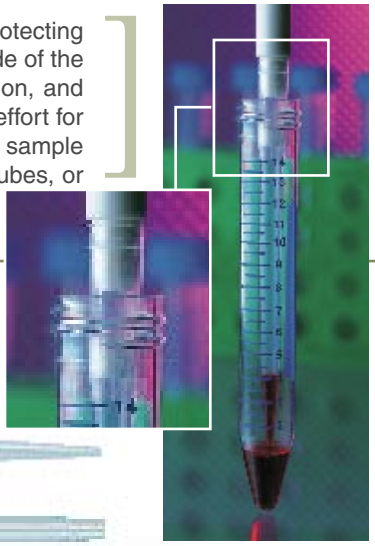
Work at Temperature Equilibrium

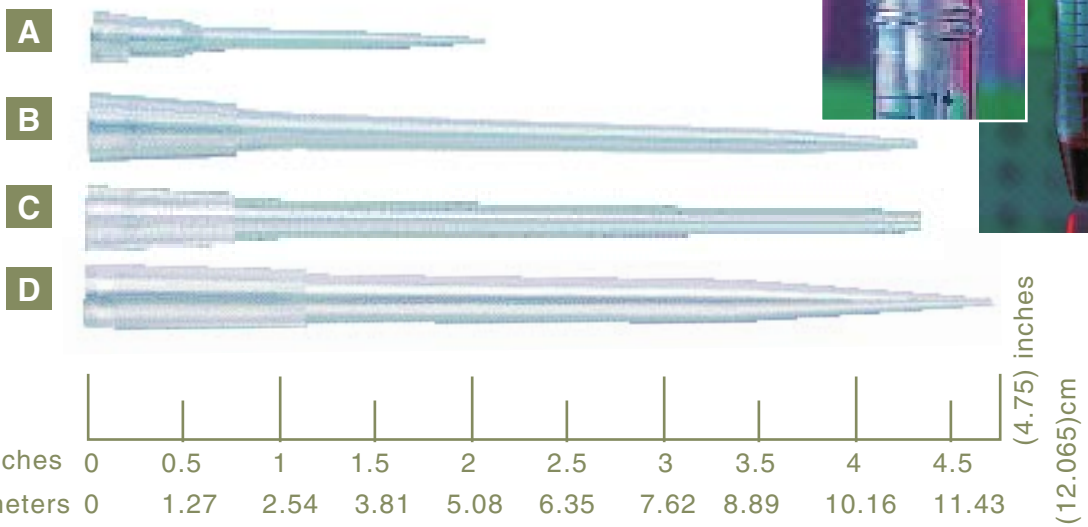
Allow liquids and equipment to equilibrate to ambient temperature.

The volume of sample delivered by air displacement pipets varies with air pressure, relative humidity, and vapor pressure of the liquid, all of which are temperature dependent. Working at a single, constant temperature minimizes the variation.

REACH - Specialty Tips

HydroLogix brand Extended Length pipet tips add a layer of security in protecting samples and pipettors by preventing the pipettor's shaft from touching the inside of the sample vessel, thus virtually eliminating the chance of carryover contamination, and the need to clean or replace pipettors. Assays remain pure, saving time and effort for each user. They are perfect for researchers and lab technicians who regularly sample from deep vessels such as 15 and 50ml centrifuge tubes, 12x75mm culture tubes, or chromatography columns.





VOLUME 10µL TO 1000µL REACH TIPS

	Catalog Number	Product	Description	Unit Packaging
A	3511	HLT 10 REACH	10µl Extended Length Tip, Clear MicroPoint Design 2µl Reference Mark	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3512	HLT 10 REACH	10µl Extended Length Tip, Clear MicroPoint Design 2µl Reference Mark	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3510	HLT 10 REACH	10µl Extended Length Tip, MicroPoint Design 2µl Reference Mark	Bulk, non-sterile, 1000 tips/bag
B	3541	HLT XLP	200µl Pipet Tip, Clear, Extra Long Length	Racked, pre-sterilized 96 tips/tray, 8 trays/pack
	3542	HLT XLP	200µl Pipet Tip, Clear, Extra Long Length	Racked, non-sterile 96 tips/tray, 8 trays/pack
	3540	HLT XLP	200µl Pipet Tip, Clear, Extra Long Length	Bulk, non-sterile, 1000 tips/bag
C	3701	HLT XLG	200µl Extended Length Tip, Clear Large Orifice Wide Bore	Racked, pre-sterilized 96 tips/tray, 8 trays/pack
	3702	HLT XLG	200µl Extended Length Tip, Clear Large Orifice Wide Bore	Racked, non-sterile 96 tips/tray, 8 trays/pack
	3700	HLT XLG	200µl Extended Length Tip, Clear Large Orifice Wide Bore	Bulk, non-sterile, 1000 tips/bag
D	3791	HLT 1000 REACH	1000µl Extended Length Tip, Clear SoftFit Design Certified Pure	Racked, pre-sterilized 100 tips/tray, 8 trays/pack
	3792	HLT 1000 REACH	1000µl Extended Length Tip, Clear SoftFit Design	Racked, non-sterile 100 tips/tray, 8 trays/pack

For pipettor tip fits information see appendix page 137

Wide Bore - Specialty Tips

These specialty Wide Bore Tips are designed for researchers dealing with macromolecules like genomic DNA and are especially critical when transferring fragile cellular samples such as macrophages, hybridomas and hepatocytes. When these samples are forced through the narrow tip orifice of conventional tips, they are subjected to mechanical shearing forces that can cause trauma and fragmentation to the cells being transferred. The result is often a decrease in plating capability and compromised cell viability. Our wide bore blunt end tip orifice eliminates cell shearing and flow resistance, making this tip ideal for very viscous material. Whether you are working with macromolecules, viscous material, plant tissues, or doing cell suspensions HydroLogix wide bore tips will keep your research studies alive, whole, and in tact. An Extended Length 200ul tip is available for those hard-to-reach applications or you can use the standard 200ul or 1000ul tip. If your protocol requires the use of a barrier tip, it is available as well; please refer to the ART section of this catalog.

A

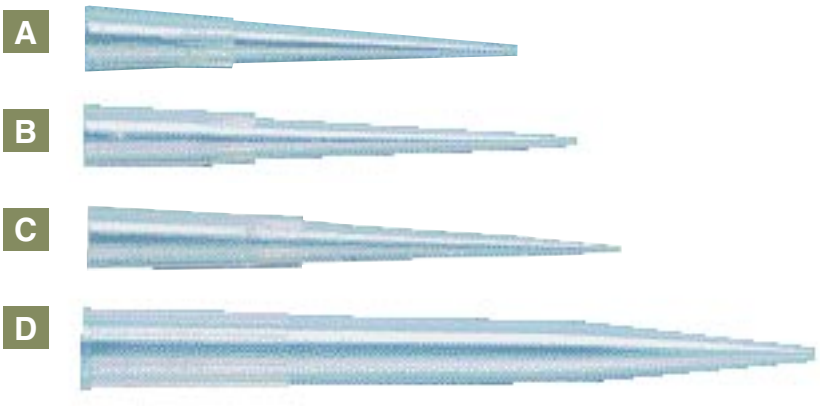
B

C

VOLUME 200µL TO 1000µL WIDE BORE GENOMIC

	Catalog Number	Product	Description	Unit Packaging
	Wide Bore Tips			
A	3531	HLT 200G	200µl Pipet Tip, Clear, Large Orifice	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3532	HLT 200G	200µl Pipet Tip, Clear, Large Orifice	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3530	HLT 200G	200µl Pipet Tip, Clear, Large Orifice	Bulk, non-sterile, 1000 tips/bag
B	3701	HLT XLG	200µl Extended Length Tip, Clear Large Orifice	Racked, pre-sterilized 96 tips/tray, 8 trays/pack
	3702	HLT XLG	200µl Extended Length Tip, Clear Large Orifice	Racked, non-sterile 96 tips/tray, 8 trays/pack
	3700	HLT XLG	200µl Extended Length Tip, Clear Large Orifice	Bulk, non-sterile, 1000 tips/bag
C	3591	HLT 1000G	1000µl Pipet Tip, Clear Large Orifice	Racked, pre-sterilized 100 tips/tray, 8 trays/pack
	3592	HLT 1000G	1000µl Pipet Tip, Clear Large Orifice	Racked, non-sterile 100 tips/tray, 8 trays/pack
	3590	HLT 1000G	1000µl Pipet Tip, Clear Large Orifice	Bulk, non-sterile, 1000 tips/bag

For pipettor tip fits information see appendix page 137



VOLUME 200µL TO 1500µL SPECIALTY TIPS~TITERTEK STYLE

	Catalog Number	Product	Description	Unit Packaging
	Titertek 200µl			
A	3851	HLT Titertek 200	200µl Pipet Tip, Clear	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3852	HLT Titertek 200	200µl Pipet Tip, Clear	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3850	HLT Titertek 200	200µl Pipet Tip, Clear	Bulk, non-sterile, 1000 tips/bag
	Titertek 300µl			
B	3861	HLT Titertek 300	300µl Pipet Tip, Clear	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3862	HLT Titertek 300	300µl Pipet Tip, Clear	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3860	HLT Titertek 300	300µl Pipet Tip, Clear	Bulk, non-sterile, 1000 tips/bag
C	3571	HLT Titertek 300	300µl Pipet Tip, Clear, Graduations at 10, 50, 100 & 200µl	Racked, pre-sterilized 96 tips/tray, 10 trays/pack
	3572	HLT Titertek 300	300µl Pipet Tip, Clear, Graduations at 10, 50, 100 & 200µl	Racked, non-sterile 96 tips/tray, 10 trays/pack
	3570	HLT Titertek 300	300µl Pipet Tip, Clear, Graduations at 10, 50, 100 & 200µl	Bulk, non-sterile, 1000 tips/bag
	Titertek 1500µl			
D	3893	HLT Titertek 1500	1500µl Pipet Tip, Clear, Fits Titertek Multi-Stepper	Racked, pre-sterilized 96 tips/tray, 10 trays/pack

For pipettor tip fits information see appendix page 137

A

B

C

VOLUME 1200µL TO 1300µL
SPECIALTY TIPS~BIOHIT AND MATRIX STYLE

Catalog Number	Product	Description	Unit Packaging
Biohit 1200µl			
3801	HLT 1200	1200µl Pipet Tip, Clear Fits Biohit Proline Pipettor	Racked, pre-sterilized 96 tips/tray, 10 trays/pk
3802	HLT 1200	1200µl Pipet Tip, Clear Fits Biohit Proline Pipettor	Racked, non-sterile 96 tips/tray, 10 trays/pk
3800	HLT 1200	1200µl Pipet Tip, Clear Fits Biohit Proline Pipettor	Bulk, non-sterile, 1000 tips/bag
Matrix 1250µl			
3681	HLT 1250	1250µl Pipet Tip, Clear Fits Matrix Pipettor	Racked, pre-sterilized 96 tips/tray, 10 trays/pk
3682	HLT 1250	1250µl Pipet Tip, Clear Fits Matrix Pipettor	Racked, non-sterile 96 tips/tray, 10 trays/pk
3680	HLT 1250	1250µl Pipet Tip, Clear Fits Matrix Pipettor	Bulk, non-sterile, 1000 tips/bag
Matrix 1300µl			
3891	HLT 1300	1300µl Pipet Tip, Clear Fits Matrix Pipettor	Racked, non-sterile 96 tips/tray, 10 trays/pk
3892	HLT 1300	1300µl Pipet Tip, Clear Fits Matrix Pipettor	Racked, pre-sterilized 96 tips/tray, 10 trays/pk
3890	HLT 1300	1300µl Pipet Tip, Clear Fits Matrix Pipettor	Bulk, non-sterile, 1000 tips/bag

For Pipettor Tip Fits Information see Appendix on page 137

EXAMINE THE TIP BEFORE DISPENSING SAMPLE

Wipe the tip only if there is liquid on the outside of the tip, and then, very carefully.

Absorbent material will rapidly absorb sample from the tip if it contacts the tip opening. Unnecessary tip wiping increases the possibility of sample loss.

"Science...never solves a problem without creating ten more."

George Bernard Shaw

1.800.995.2787 | 1.858.453.7551 | INFO@MBPINC.COM

BioRobotix Brand Pipet Tips For Your Automated Workstation

MBP • SECTION 03

Index		Product	Page
1		Tecan®	
	a.	Genesis, Freedom™, MiniPrep, Evo™	52
	b.	GenMate®	55
	c.	TEMO™, Aquarius	56
2		Beckman®	
	a.	Biomek® FX/NX, Multimek™ AP96, Biomek 3000	57
	b.	Biomek FX/NX Span-8™	58
	c.	Biomek 2000, 1000	58
	d.	Multimek Type II	58
	e.	Biomek FX/NX 384, Multimek AP384	59
	f.	Low Retention Beckman	60
3		Perkin-Elmer®/Packard®	
	a.	MultiPROBE® II HT, HT EX	61
	b.	PlateTrak™, MiniTrak™, Evolution P-3	63
4		Molecular Devices® FLIPR®	64
5		CALIPER / Zymark®	
	a.	RapidPlate®, Presto, SciClone, Allegro	65
	b.	Twister® Plate Handler	66
6		Qiagen	
	a.	BioRobot 3000, 8000, 9600 and 9604 Rosys and Colibri workstations	67

BioRobotix Brand Pipet Tips
Building A Legacy

Eight years ago, as automated liquid handling protocols began to take a strong foothold in the HTS process, Molecular BioProducts began receiving numerous requests to make its patented ART barrier technology available in pipet tips designed for automated platforms. These requests came from instrument manufacturers and customers alike; like our customers, we set our sights on the future, and embarked on the arduous process of redefining and elevating our design and manufacturing techniques to a level that could adhere to tolerances 400% tighter than standard pipet tips.

During this time we have learned many of the same lessons that our customers have about just how critical a choice the consumable becomes when used as a component of a highly sophisticated system. This is because, prior to designing and building a BioRobotix brand tip, we purchase the equipment, buy the consumables available, and begin running applications in our lab, just like our customers. The only difference being that we are examining every conceivable aspect of how the consumable can affect the performance of a particular system and what can be done to improve upon it.

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What is presented here, is what we feel to be the most critical factors when choosing a consumable for your liquid handling system, in order of importance:

PERFORMANCE: In terms of precision and accuracy as measured by %CV, performance is the most critical factor when choosing a tip, and the differences in performance of the tips currently available on the market is vast. The loosest specification on a BioRobotix brand tip is <2.5% and the tightest is <1%. For a discussion on CV calculations please read our %CV primer located on our website, www.mbpinc.com

AVAILABILITY: It is important to understand that the tips you are using for your automated workstations are extremely difficult to produce. The specifications on these tips are tighter than regular pipet tips by an order of magnitude. As such, all manufacturers have had, and will continue to have, occasional supply problems. Anyone who tells you otherwise is being less than honest. Since you need confidence in the availability of product, be sure to choose manufacturers with experience and solid distribution networks. Over 300 dealers worldwide stock MBP BioRobotix brand tips, and in the rare instances where we experience production problems, we can probably find product for you within our distribution network.

TECHNICAL SERVICE: Not only are your robotic platforms sophisticated and delicate pieces of equipment, they are produced in a very different manner than pipet tips. Pipet tips are mass-produced in quantities of many millions per day, and as such they are very similar, while your robots are hand assembled and milled one or two at a time. The variations from machine to machine make it difficult to run mass-produced parts and often adjustments are required to ensure consistent, steady operation. Be sure to purchase your supplies from a company that is knowledgeable with the systems, consumables, and operation of your equipment. Molecular BioProducts boasts a large and very knowledgeable Customer Service and Sales department versed in your liquid handling needs. Additionally, we have a group of field engineers whose job it is to visit customers on site when detailed technical support is required.

SELECTION: This is an often overlooked element. Many do not realize the wide array of tips available for use on the various liquid handling systems. There are many variations of the standard robotic tips that may more closely suit your particular needs. Within this catalog you will find over 162 SKU's designed to fit across 40 different instrument and head variations. Whether

you are pipetting viscous materials, concerned about aerosol contamination, looking for liquid-sensing or low retention polymers, chances are that we have a tip particularly suited to your needs. Validation samples are available for free at www.mbpinc.com.

NO REPROGRAMMING: We hate reprogramming our robots and try to avoid it at all costs. Therefore, we believe that our customers wish to avoid this as well. Approximately 90% of our product offering is ready-to-use. However, some of our more unique specialty tips do require adjustments to your robot – but, sometimes that is the price of superior performance. When required, easy-to-follow instructions are included with the product.

CERTIFICATION: There is always a level of confidence added to the decision to purchase a robotic tip when the instrument manufacturer certifies it for use. Not only do many of our tips bear this certification, we manufacture tips for some of the most advanced instrument companies in the world.

PRICE: As always, price is a concern when purchasing disposables. Depending upon your application and the weight you apply to the preceding six factors, price may not rank last. However, we firmly believe that it should never rank first. The quality and consistency necessary to keep your instruments running costs money in terms of Support, R&D, Cleanliness, Inspection, Materials, and even Supply Chain Management. Molecular BioProducts strives to provide you with the highest quality at the fairest price.

At Molecular BioProducts we truly believe that our tips are the best in the market. There are two reasons for this: being the first in the market and offering the broadest range of products, we have the most experience and expertise in the design and development of consumables for automated liquid handling. Secondly, we feel that our most valuable piece of intellectual property is our quality system. It is this system that transcends every aspect of the design, manufacture, and assembly of the products you purchase from MBP.

When addressing the quality control applied to these products, we generally refer to four areas of inspection that occur at multiple points in the production process. These categories are Visual, Dimensional, Functional, and Purity. Some of the aspects of each of these areas follow:

1. Visual Inspection focuses on blemishes that could cause a functional failure, or, if not treated, could lead to a functional failure. Distortion, short shots, voids, bubbles, cloudiness, knit lines, and flash are just a few of the items we inspect for in this category.

2. Dimensional Inspection focuses on testing measurable attributes of the parts. For example, total indicator run-out (which is a measure of straightness), wall thickness, weight, and out-of-round are all critical elements addressed during and after production.

3. Functional Inspection focuses on the part's interaction with the very workstation you are using. This is where BioRobotix brand tips get put to the test; we measure for seal-force, leaking, precision, accuracy, insertion depths, tray flatness, hole spacing, and much more.

4. Purity Inspection, the final category, is not only a protocol, but also a methodology in our manufacturing process. Safeguard and handling requirements on our production floor and assembly lines are the reason that an independent lab can certify every pre-sterilized lot of product as RNA, DNA, RNase, DNase, Pyrogen, and ATP free. Certificates of sterility are also available for all pre-sterilized products. Our testing protocols are listed in the technical section of this catalog.

Our journey started over eight years ago when we set out to make the most advanced line of tips available for automated, liquid-handling workstations. Beginning with the innovative manufacturing technologies necessary to produce these products, to the implementation of a sophisticated quality control process to monitor all aspects of each product's production, we will continue with our undivided commitment to be at the forefront of the development of high quality products for this segment of the liquid-handling market. Looking to the future, we promise to continue to supply you with the most exceptional and broadest range of tips designed for the automated laboratory environment.

Tecan

Get more performance from your Tecan workstation with BioRobotix brand pipet tips. MBP provides several tip options unavailable through other manufacturers. Our 20µl and 50µl liquid-sensing and clear Tecan tips increase the precision of low volume pipetting through minimization of dead air volume within the pipet tip. All Tecan tips come packaged in our unique and hermetically sealed blister packs.

A

B

Fits Tecan Genesis, Tecan Freedom, Tecan Evo, Tecan Miniprep and Cavro Workstations

Tecan Liquid Sensing Genomic (Wide-bore) Tips

	Catalog Number	Description	Unit Packaging
A	903-251G	200µl Liquid Sensing pre-sterilized large orifice	96 tips/tray ,10 trays/pack
	903-252G	200µl Liquid Sensing non-sterile large orifice	96 tips/tray, 10 trays/pack
	903-011G	175µl Liquid Sensing pre-sterilized ART barrier large orifice	96 tips/tray ,10 trays/pack
B	904-251G	1000µl Liquid Sensing pre-sterilized large orifice	96 tips/tray ,10 trays/pack
	904-252G	1000µl Liquid Sensing non-sterile large orifice	96 tips/tray, 10 trays/pack
	904-011G	1000µl Liquid Sensing pre-sterilized ART barrier large orifice	96 tips/tray, 10 trays/pack

Fits Tecan Genesis, Tecan Freedom, Tecan Evo, Tecan MiniPrep and Cavro Workstations

Tecan Style Liquid Sensing Tips

	Catalog Number	Description	Unit Packaging
A	901-251	20µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	901-252	20µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	901-253	20µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	901-011	10µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	902-251	50µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	902-252	50µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	902-253	50µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	902-011	50µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
C	903-251	200µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	903-252	200µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	903-253	200µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	903-011	175µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
D	904-251	1000µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	904-252	1000µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	904-253	1000µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	904-011	1000µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

NEW - TECAN CLEARS RE-DESIGNED!

New and improved for the Genesis, Freedom, Evo, and Cavro workstations are the clear versions of our liquid sensing Tecan tips. Designed for researchers not utilizing the conductive features of their platforms, or requiring visual confirmation of their pipetting, these crystal clear tips are available in four sizes, sterile and non-sterile, and with or without the patented ART barrier.

A

B

C

D

FITS TECAN GENESIS, TECAN FREEDOM, TECAN EVO, AND CAVRO WORKSTATIONS

Tecan Style Clear Tips

	Catalog Number	Description	Unit Packaging
A	901-261	20µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	901-262	20µl Clear non-sterile	96 tips/tray, 10 trays/pack
	901-021	10µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	902-261	50µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	902-262	50µl Clear non-sterile	96 tips/tray, 10 trays/pack
	902-021	50µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
C	903-261	200µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	903-262	200µl Clear non-sterile	96 tips/tray, 10 trays/pack
	903-021	175µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
D	904-261	1000µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	904-262	1000µl Clear non-sterile	96 tips/tray, 10 trays/pack
	904-021	1000µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

A

B

Fits Tecan GenMate

Tecan Style Clear Tips

	Catalog Number	Description	Unit Packaging
A	3761	50µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	3762	50µl Clear non-sterile	96 tips/tray, 10 trays/pack
	2760	50µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	3771	300µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	3772	300µl Clear non-sterile	96 tips/tray, 10 trays/pack
	2790	175µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

A Note on Availability

Whether you are currently using BioRobotix brand tips or tips manufactured by another company, we strongly recommend that you have a second source of tips validated for your protocols at all times. As stated earlier, production of these tips is incredibly complex and our experience is that it is easier to validate two tips at the beginning of a protocol than validating a new tip while your application is shut down. We regularly help our customers with validation protocols, so feel free to call us with any questions.

Use Standard Mode Pipetting

Choose standard mode pipetting rather than “reverse mode”, for all but viscous samples, if accurate and precise results are desired.

In reverse mode pipetting, the plunger is depressed completely (past the first stop) to aspirate the sample, and then depressed only to the first stop to deliver the sample.

New! - Tecan Temo Certified Tips!

New to the BioRobotix line, these Tecan TEMO tips have been certified by Tecan for use on their newest workstations, the Tecan TEMO. The TEMO can either be a stand-alone workstation (Tecan Aquarius) or used as a second head on the Tecan Genesis – and MBP is the only manufacturer to offer Certified tips for this new head. Order your free validation samples today!

A 

B 

C 

Fits Tecan Temo and Tecan Aquarius

Tecan Style Clear Tips

	Catalog Number	Description	Unit Packaging
A	906-261	50µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	906-262	50µl Clear non-sterile	96 tips/tray, 10 trays/pack
	906-021	50µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	907-261	100µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	907-262	100µl Clear non-sterile	96 tips/tray, 10 trays/pack
	907-021	80µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
C	908-261	200µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	908-262	200µl Clear non-sterile	96 tips/tray, 10 trays/pack
	908-021	150µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

Beckman 96-Well Tips

New Beckman 10µl Tip
The only true 10µl Biomek FX tip does not have the large air gap found when trying to Pipet 10µl or less with the 20µl tip: the 20µl can actually hold 70µl. This true 10µl leads to lower %CVs and better reproducibility.

A 

B 

C 

D 

Fits Beckman Biomek FX/NX, Multimek AP96, and Biomek 3000

Catalog Number	Description	Unit Packaging
Beckman Style Clear Tips		
A 912-261	10µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
912-262	10µl Clear non-sterile	96 tips/tray, 10 trays/pack
912-021	8µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B 918-261	20µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
918-262	20µl Clear non-sterile	96 tips/tray, 10 trays/pack
918-021	20µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
C 919-261	250µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
919-262	250µl Clear non-sterile	96 tips/tray, 10 trays/pack
919-021	130µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
Beckman Style Clear Genomic (Wide-bore) Tips		
D 919-261G	250µl Clear pre-sterilized large orifice	96 tips/tray, 10 trays/pack
919-262G	250µl Clear non-sterile large orifice	96 tips/tray, 10 trays/pack
919-021G	130µl Clear pre-sterilized ART barrier large orifice	96 tips/tray, 10 trays/pack

E

F

Span - 8 For The Biomek FX

Don't settle for clear versions of your Span-8 tips – MBP's experience in molding liquid-sensing tips has created the most reliable and consistent product for your Span-8 head. Make the most of your FX's liquid sensing capabilities with our 20µl and 250µl tips.

Fits Beckman Biomek FX/NX with a Span-8 head

Beckman Style Liquid Sensing Tips

	Catalog Number	Description	Unit Packaging
E	918-251	20µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	918-252	20µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	918-011	20µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
F	919-251	250µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	919-252	250µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	919-011	130µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

A

B

Fits Beckman Biomek 2000 and Biomek 1000

Beckman Style Clear Tips

	Catalog Number	Description	Unit Packaging
A	915-261	20µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	915-262	20µl Clear non-sterile	96 tips/tray, 10 trays/pack
	915-021	20µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	917-261	200µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	917-262	200µl Clear non-sterile	96 tips/tray, 10 trays/pack
	917-021	130µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

C

D

Fits Beckman Multimek w/ Type II Head (Requires a 3772 Adapter**)

Beckman Style Clear Tips

	Catalog Number	Description	Unit Packaging
C	3761	50µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	3762	50µl Clear non-sterile	96 tips/tray, 10 trays/pack
	2760	50µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
D	3771	300µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	3772	300µl Clear non-sterile	96 tips/tray, 10 trays/pack
	2790	175µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

** These tips must be used in conjunction with a 3772 Adapter. Contact MBP for details.

Beckman 384-well Tips

Designed to tolerances strict enough to hit 1536-well plates each and every time, MBP's Beckman style 384-well tips offer incomparable straightness and seal force for the most demanding of experiments. These are your tips of choice for institutions running the Biomek FX/NX or Multimek with a 384-well head. This is the only 384-well pipet tip available with aerosol protection technology.

A 

Fits Beckman Biomek FX/NX with a 384-well head or Multimek AP384

Beckman Style Clear 384-well Tips

Catalog Number	Description	Unit Packaging
A 935-261	30µl Clear pre-sterilized	384 tips/tray, 10 trays/pack
935-262	30µl Clear non-sterile	384 tips/tray, 10 trays/pack
935-021	25µl Clear pre-sterilized ART barrier	384 tips/tray, 10 trays/pack

Molecular BioProducts Robotix Lab

LOW RETENTION BECKMAN

New from Molecular BioProducts, the innovator in pipet tip technology, comes a proprietary manufacturing process that creates more hydrophobic tips: now researchers can pipet viscous samples, load dyes, surfactants and solvents more accurately than ever before. With this technology, less sample is retained within the tip which decreases the amount of reagent loss while significantly increasing the levels of reproducibility from experiment to experiment.

A 

B 

FITS BECKMAN BIOMEK FX/NX, MULTIMEK AP96, AND BIOMEK 3000

Beckman Style Low Retention Clear Tips

	Catalog Number	Description	Unit Packaging
A	918-261-05	20µl Clear pre-sterilized Low Retention	96 tips/tray, 10 trays/pack
	918-262-05	20µl Clear non-sterile Low Retention	96 tips/tray, 10 trays/pack
	918-021-05	20µl Clear pre-sterilized ART barrier Low Retention	96 tips/tray, 10 trays/pack
B	919-261-05	250µl Clear pre-sterilized Low Retention	96 tips/tray, 10 trays/pack
	919-262-05	250µl Clear non-sterile Low Retention	96 tips/tray, 10 trays/pack
	919-021-05	130µl Clear pre-sterilized ART barrier Low Retention	96 tips/tray, 10 trays/pack

C 

D 

FITS BECKMAN BIOMEK 2000 AND BIOMEK 1000

Beckman Style Low Retention Clear Tips

	Catalog Number	Description	Unit Packaging
C	915-261-05	20µl Clear pre-sterilized Low Retention	96 tips/tray, 10 trays/pack
	915-262-05	20µl Clear non-sterile Low Retention	96 tips/tray, 10 trays/pack
	915-021-05	20µl Clear pre-sterilized ART barrier Low Retention	96 tips/tray, 10 trays/pack
D	917-261-05	250µl Clear pre-sterilized Low Retention	96 tips/tray, 10 trays/pack
	917-262-05	250µl Clear non-sterile Low Retention	96 tips/tray, 10 trays/pack
	917-021-05	130µl Clear pre-sterilized ART barrier Low Retention	96 tips/tray, 10 trays/pack

E 

FITS BECKMAN BIOMEK FX/NX WITH A 384-WELL HEAD OR MULTIMEK AP384

Beckman Style Low Retention Clear 384-well Tips

	Catalog Number	Description	Unit Packaging
E	935-261-05	30µl Clear pre-sterilized Low Retention	384 tips/tray, 10 trays/pack
	935-262-05	30µl Clear non-sterile Low Retention	384 tips/tray, 10 trays/pack
	935-021-05	25µl Clear pre-sterilized ART barrier Low Retention	384 tips/tray, 10 trays/pack

PERKIN-ELMER/PACKARD MULTIPROBE II HT HANGING TIPS

MBP's MultiPROBE hanging tips have been the reliable and consistent choice of many researchers for years. These tips were designed specifically for the MultiPROBE II HT, ensuring a superior fit every time. Offered in clear or liquid-sensing, our tips guarantee the highest level of performance for your critical applications.

A

B

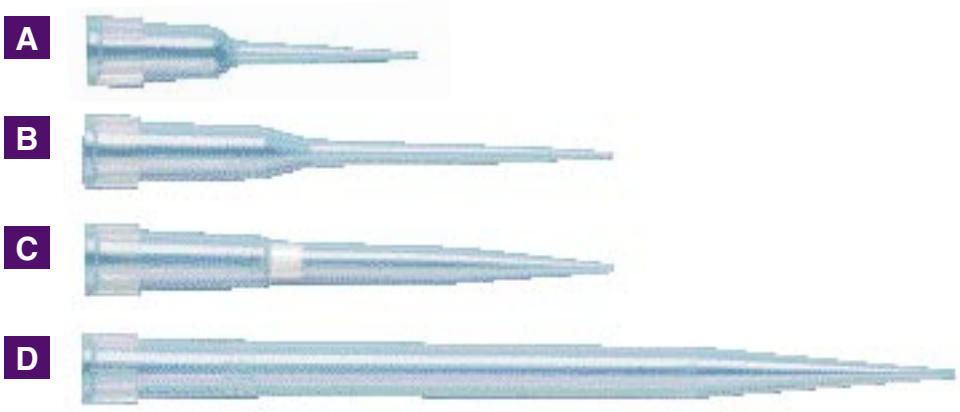
C

D

FITS PERKIN-ELMER/PACKARD MULTIPROBE II HT, MULTIPROBE II HT EX WITH HANGING TIPS

Perkin-Elmer Style Liquid Sensing Tips

	Catalog Number	Description	Unit Packaging
A	901-251	20µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	901-252	20µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	901-253	20µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	901-011	10µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	902-251	50µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	902-252	50µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	902-253	50µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	902-011	50µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
C	903-251	200µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	903-252	200µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	903-253	200µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	903-011	175µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
D	904-251	1000µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	904-252	1000µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	904-253	1000µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	904-011	1000µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

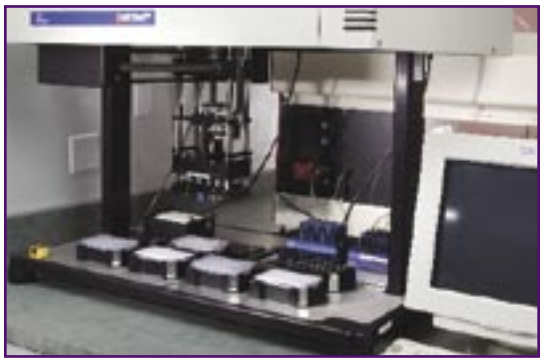


Fits Perkin-Elmer/Packard MultiPROBE II HT, MultiPROBE II HT EX with Hanging Tips

Perkin-Elmer Style Clear Tips

	Catalog Number	Description	Unit Packaging
A	901-261	20µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	901-262	20µl Clear non-sterile	96 tips/tray, 10 trays/pack
	901-021	10µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	902-261	50µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	902-262	50µl Clear non-sterile	96 tips/tray, 10 trays/pack
	902-021	50µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
C	903-261	200µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	903-262	200µl Clear non-sterile	96 tips/tray, 10 trays/pack
	903-021	175µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
D	904-261	1000µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	904-262	1000µl Clear non-sterile	96 tips/tray, 10 trays/pack
	904-021	1000µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

NEW-PERKIN-ELMER/PACKARD CCS TIPS!



Enhance the performance of your Perkin-Elmer CCS workstations with MBP's newest BioRobotix tips. Designed for PlateTrak, MiniTrak & Evolution P-3, these tips offer the ultimate in precision for your toughest multi-dispensing assays. Available in 20µl, 50µl, and 235µl volumes, and in sterile, non-sterile & ART barrier formats. In addition, only MBP now offers our CCS 384s in the coveted 96-well format for 96-well pipetting from your CCS 384-well heads!

A 

B 

C 

FITS PERKIN-ELMER/PACKARD PLATETRAK, MINITRAK & EVOLUTION P-3

Perkin-Elmer CCS Style Clear Tips

	Catalog Number	Description	Unit Packaging
A	925-261	20µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	925-262	20µl Clear non-sterile	96 tips/tray, 10 trays/pack
	925-021	10µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	927-261	50µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	927-262	50µl Clear non-sterile	96 tips/tray, 10 trays/pack
	927-021	40µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
C	929-261	235µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	929-262	235µl Clear non-sterile	96 tips/tray, 10 trays/pack
	929-021	180µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

D 

E 

FITS PERKIN-ELMER/PACKARD PLATETRAK, MINITRAK & EVOLUTION P-3 WITH A 384-WELL HEAD

Perkin-Elmer CCS Style Clear 384-well Tips

	Catalog Number	Description	Unit Packaging
D	931-261	30µl Clear pre-sterilized	384 tips/tray, 10 trays/pack
	931-262	30µl Clear non-sterile	384 tips/tray, 10 trays/pack
	931-021	20µl Clear pre-sterilized ART barrier	384 tips/tray, 10 trays/pack
E	931-362	30µl Clear non-sterile 384 tips	96 tips/tray, 10 trays/pack
	931-322	20µl Clear non-sterile ART barrier 384 tips	96 tips/tray, 10 trays/pack

Molecular Devices FLIPR 384-well Tips

If unsurpassed straightness and low %CV's at a competitive price is what you are looking for in your Molecular Devices FLIPR tips, MBP is your choice. Only MBP offers FLIPR style tips to fit both the "Type A" CCS 384-well head and the "Type B" Liberty 384-well head in several different varieties. Log on to www.mbpinc.com for your free validation samples today!

A

Fits Molecular Devices FLIPR with a "Type A" or CCS 384-well head

A

Molecular Devices Style Clear 384-well Tips		
Catalog Number	Description	Unit Packaging
931-261	30µl Clear pre-sterilized	384 tips/tray, 10 trays/pack
931-262	30µl Clear non-sterile	384 tips/tray, 10 trays/pack
931-021	20µl Clear pre-sterilized ART barrier	384 tips/tray, 10 trays/pack

B

Fits Molecular Devices FLIPR with a "Type B" or Liberty 384-well head

B

Molecular Devices Style Clear 384-well Tips		
Catalog Number	Description	Unit Packaging
937-261	30µl Clear pre-sterilized	384 tips/tray, 10 trays/pack
937-262	30µl Clear non-sterile	384 tips/tray, 10 trays/pack

Caliper/Zymark Automation Certified Pipet Tips

Molecular BioProducts is the exclusive manufacturer of the 96-well format Caliper Automation Certified Pipet Tips. MBP and Caliper have partnered to provide users with the highest quality and best value consumables for their Caliper Rapidplates and Sciclones. These products are manufactured to Caliper's exacting specifications under stringent quality assurance guidelines. All racks provide the sturdiness required by automation equipment, and the tips are designed to provide exceptional straightness. In addition, all tips are certified to be DNAse and RNAse free. Sterile, Non-Sterile, and ART versions of the 96-well formats are available in 50µl, 100µl, and 200µl volumes.

A 

B 

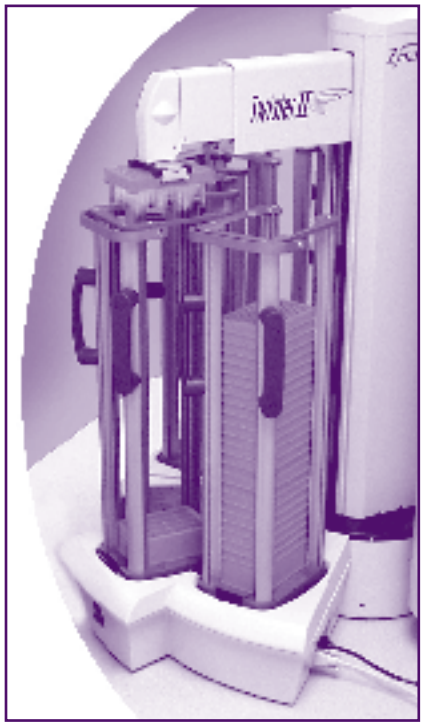
C 

D 

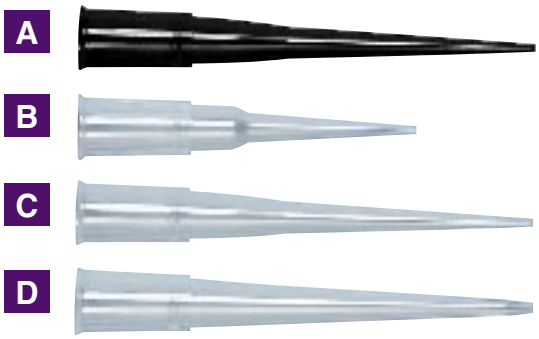
Fits Caliper/Zymark RapidPlate, Presto, SciClone & Allegro

	Catalog Number	Description	Unit Packaging
	Caliper/Zymark Style Clear Tips		
A	920-261	50µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	920-262	50µl Clear non-sterile	96 tips/tray, 10 trays/pack
	920-021	40µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	921-261	100µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	921-262	100µl Clear non-sterile	96 tips/tray, 10 trays/pack
	921-021	80µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
C	923-261	200µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	923-262	200µl Clear non-sterile	96 tips/tray, 10 trays/pack
	923-021	150µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
	Caliper/Zymark Style Clear Genomic (Wide-bore) Tips		
D	921-261G	100µl Clear pre-sterilized large orifice	96 tips/tray, 10 trays/pack
	921-262G	100µl Clear non-sterile large orifice	96 tips/tray, 10 trays/pack
	921-021G	80µl Clear pre-sterilized ART barrier large orifice	96 tips/tray, 10 trays/pack

CALIPER/ZYMARK CERTIFIED TWISTER



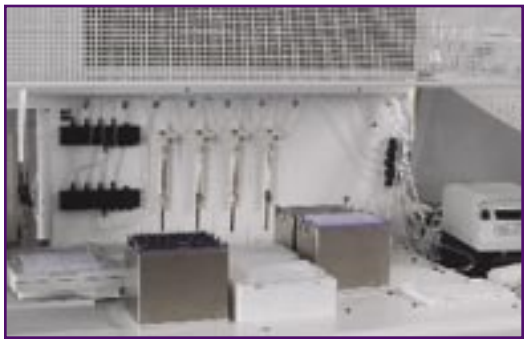
For use with CALIPER/Zymark instrumentation. Microplate style pipet tip trays are specifically designed for use with the Twister and Twister II Plate handlers. This allows the transfer of pipet tips onto CALIPER/Zymark RapidPlate 96/384 and SciClone ALH workstations with minimal manual intervention.



FITS CALIPER/ZYMARK TWISTER PLATE HANDLER WITH RAPIDPLATE, PRESTO, SCICLONE & ALLEGRO

Catalog Number	Description	Unit Packaging
Caliper/Zymark Style Liquid Sensing Tips		
921-251-30	100µl Liquid Sensing pre-sterilized	96 tips/tray, stacks of 30 plates
921-252-30	100µl Liquid Sensing non-sterile	96 tips/tray, stacks of 30 plates
Caliper/Zymark Style Clear Tips		
920-261-30	50µl Clear pre-sterilized	96 tips/tray, stacks of 30 plates
920-262-30	50µl Clear non-sterile	96 tips/tray, stacks of 30 plates
921-261-30	100µl Clear pre-sterilized	96 tips/tray, stacks of 30 plates
921-262-30	100µl Clear non-sterile	96 tips/tray, stacks of 30 plates
923-261-30	200µl Clear pre-sterilized	96 tips/tray, stacks of 30 plates
923-262-30	200µl Clear non-sterile	96 tips/tray, stacks of 30 plates

QIAGEN



Aspire to the best in quality for your Qiagen BioRobots. Only MBP's Qiagen tips can offer superior liquid-sensing technology to perform seamlessly with both the old and new Qiagen software. These are the only Qiagen tips offered with our patented ART barrier as well as in sterile or non-sterile varieties. Contact MBP Customer Service today for a free trial!

A

B

Fits Qiagen BioRobot 3000, BioRobot 8000, BioRobot 9600, BioRobot 9604, Rosys and Colibri

QIAGEN/Rosys/Colibri Style Liquid Sensing Tips

	Catalog Number	Description	Unit Packaging
A	951-251	300µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	951-252	300µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	951-253	300µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	951-011	250µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
B	953-251	1100µl Liquid Sensing pre-sterilized	96 tips/tray, 10 trays/pack
	953-252	1100µl Liquid Sensing non-sterile	96 tips/tray, 10 trays/pack
	953-253	1100µl Liquid Sensing non-sterile Econopak	96 tips/tray, 50 trays/pack
	953-011	1000µl Liquid Sensing pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

C

D

Fits Qiagen BioRobot 3000, BioRobot 8000, BioRobot 9600, BioRobot 9604, Rosys and Colibri

Qiagen/Rosys/Colibri Style Clear Tips

	Catalog Number	Description	Unit Packaging
C	951-261	300µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	951-262	300µl Clear non-sterile	96 tips/tray, 10 trays/pack
	951-021	250µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack
D	953-261	1100µl Clear pre-sterilized	96 tips/tray, 10 trays/pack
	953-262	1100µl Clear non-sterile	96 tips/tray, 10 trays/pack
	953-021	1000µl Clear pre-sterilized ART barrier	96 tips/tray, 10 trays/pack

"Whenever anyone says, 'theoretically,' they really mean, 'not really'."

Dave Parnas

1.800.995.2787 | 1.858.453.7551 | INFO@MBPINC.COM

Products for PCR

MBP • SECTION 04

Index	Product	Page
1	0.2ml Thin-wall PCR Tubes	71
2	0.5ml Thin-wall PCR Tubes	71
3	0.2ml Strip Tubes	72
4	PCR Plates	73
5	Sealing Tape	73

PCR Tubes: A Critical Component

One of the most critical and often overlooked components in PCR is the reaction tube itself. A poorly designed or contaminated PCR tube can literally ruin hours of research. There are many factors that go into the design and manufacture of a high-performance PCR tube: the grade and quality of plastic resin, the design of the seal between cap and tube, wall thickness consistency, post production QC methodology, and, of course, the control of the manufacturing and assembly environment.

MBP has applied 30 years of laboratory plastics manufacturing expertise to the production of a perfect-fitting, even-walled and immaculately clean PCR tube that will perform to your laboratory standards time and time again.

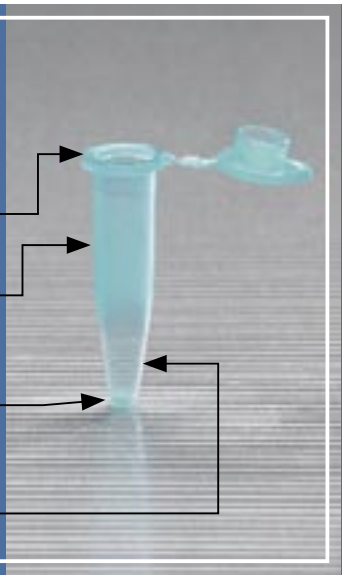
All of the tubes and plates that you will find in this section are made of the highest grades of virgin polypropylene, are thin-walled for optimum heat transfer, and will fit your thermocycler like a glove. All products are packaged Pure which means they are free of RNase, DNase, Nucleic acids, ATP, and Pyrogens. These products come with our 100% satisfaction guarantee, and once you try them you will never go back.

REDUCE CONTAMINATION RISK

All sterile HLT branded tubes are certified "PURE". The lot testing protocols used in PURE certification are: DNA contamination, RNase and DNase Detection, Pyrogen Detection, Bioburden, PCR Inhibition, ATP Detection, and Sterility Verification. Our stringent manufacturing and QA/QC testing procedures assure you and your samples the most aseptic products on the market.

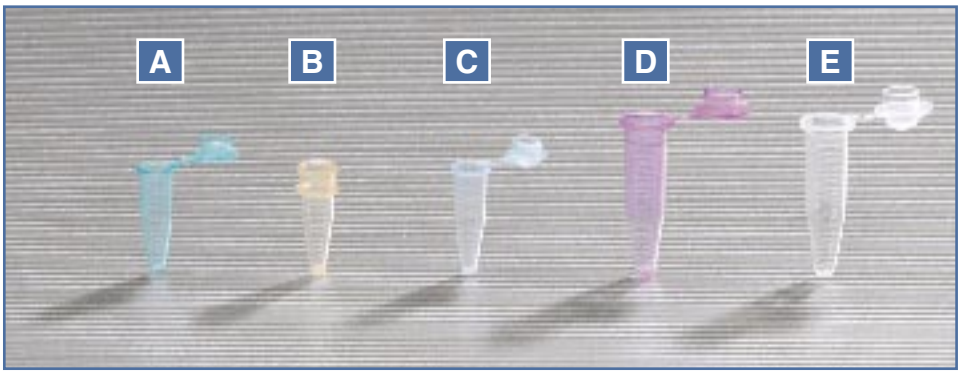
PCR TUBES

1. Secure Seal Lip protects against evaporation
2. Thin-wall design for optimum heat transfer
3. Wall angle dimension for correct thermocycler contact
4. 100% virgin polypropylene for clarity



Designed to Protect the Integrity of your Product

- Quality Guarantee
- 4ml Puncture Proof Bag
- ZipLock™ closure for easy resealing
- 10 Individually sealed bags of 100 tubes helps protect against cross contamination



PCR Tubes

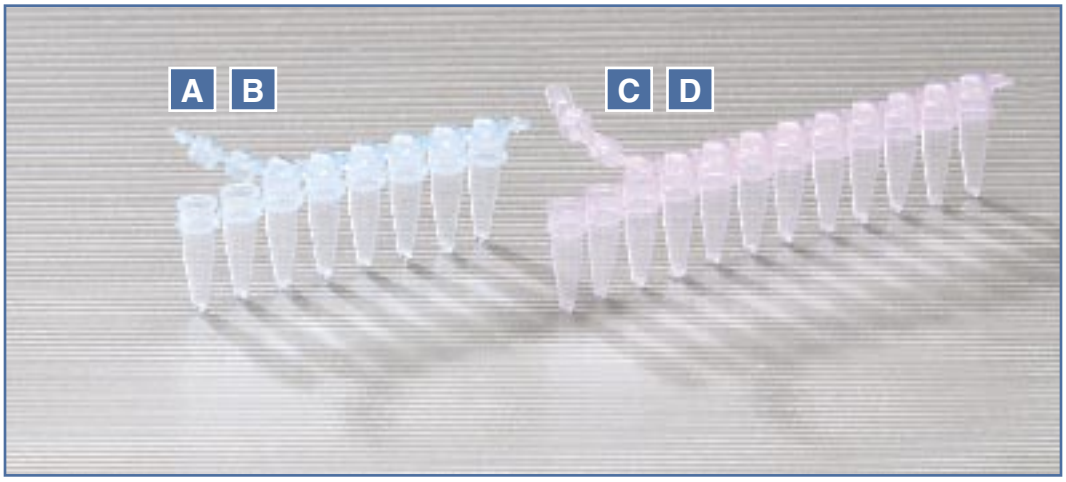
	Catalog Number	Volume	Description	Colors	Unit Packaging
A	**0.2ml Thin-wall PCR Tubes w/Frosted**				
	3412	0.2ml	Thin-wall PCR Tubes w/Flat Caps	Natural	10 bags of 100
	3412A	0.2ml	Thin-wall PCR Tubes w/Flat Caps	*Assorted	10 bags of 100
B	**0.2ml Thin-wall PCR Tubes w/Out Caps**				
	3413	0.2ml	Thin-wall Capless PCR Tubes	Natural	10 bags of 100
	3413A	0.2ml	Thin-wall Capless PCR Tubes	*Assorted	10 bags of 100
C	**0.2ml Thin-wall PCR Tubes w/Dome Caps**				
	3414	0.2ml	Thin-wall PCR Tubes w/Dome Caps	Natural	10 bags of 100
	3414A	0.2ml	Thin-wall PCR Tubes w/Dome Caps	*Assorted	10 bags of 100
D	**0.5ml Thin-wall PCR Tubes w/Frosted**				
	3430	0.5ml	Thin-wall PCR Tubes w/Flat Caps	Natural	10 bags of 100
	3430A	0.5ml	Thin-wall PCR Tubes w/Flat Caps	*Assorted	10 bags of 100
E	**0.5ml Thin-wall PCR Tubes w/Dome Caps**				
	3432	0.5ml	Thin-wall PCR Tubes w/Dome Caps	Natural	10 bags of 100
	3432A	0.5ml	Thin-wall PCR Tubes w/Dome Caps	*Assorted	10 bags of 100

* Colors: Specify desired color by adding the corresponding letter to the catalog number. Assorted colors are randomly chosen. B - Blue, G - Green, O - Orange, P - Purple, R - Red, Y - Yellow, A - Assorted. Example: 3414B= 0.2ml tubes all Blue.

PCR Strip Tubes

Strip Tubes offer a convenient and efficient method for setting up, transporting, storing and tracking your PCR samples. However, many strip tubes on the market today do not perform as well as they should. The main cause of strip tube failure is the interface between the tube and the strip cap.

MBP has overcome this common problem through the use of a proprietary manufacturing process used in the production of its hardened steel injection molding equipment. Our choices in steel design, component measuring and inspection, and the resin used in running these parts ensure that the caps will align and fit snuggly in either direction every time. The consistent spacing of the tube and cap strips means that you will no longer struggle and strain to align the caps to the tubes. That frustrating process is one you will never encounter again once you try these strip tubes.



PCR Strip Tubes

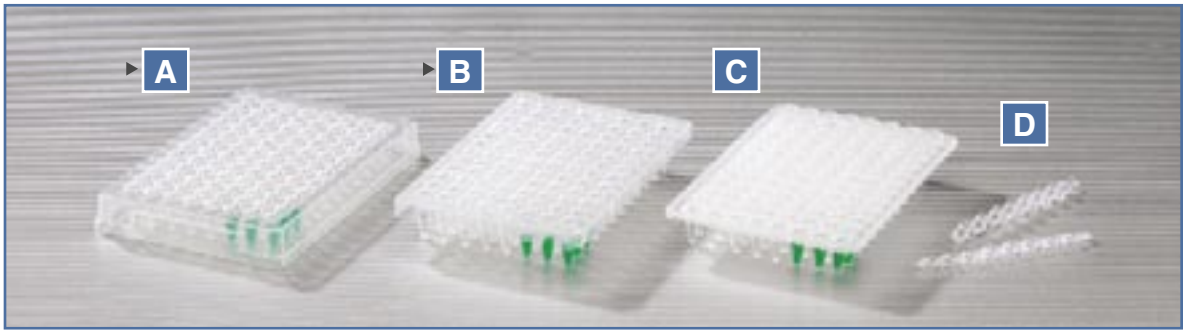
	Catalog Number	Volume	Description	Colors	Unit Packaging
A	**0.2ml Thin-wall PCR 8-Strip Tubes w/Dome Caps**				
	3418	0.2ml	8 PCR Strip Tubes (Thin-Wall)	Natural	10 bags of 12 strips
	3418A	0.2ml	8 PCR Strip Tubes (Thin-Wall)	*Assorted	10 bags of 12 strips
B	**0.2ml PCR Tube 8-Strip Caps**				
	3418C	0.2ml	8 PCR Strip Dome Caps	Natural	10 bags of 12 strips
	3418F	0.2ml	8 PCR Strip Flat Caps	Natural	10 bags of 12 strips
C	**0.2ml Thin-wall PCR 12-Strip Tubes w/Dome Caps**				
	3417	0.2ml	12 PCR Strip Tubes (Thin-Wall)	Natural	10 bags of 8 strips
	3417A	0.2ml	12 PCR Strip Tubes (Thin-Wall)	*Assorted	10 bags of 8 strips
D	**0.2ml PCR Tube 12-Strip Caps**				
	3417C	0.2ml	12 PCR Strip Dome Caps	Natural	10 bags of 8 strips

*Colors: Specify desired color by adding the corresponding letter to the catalog number. Assorted colors are randomly chosen. B - Blue, G - Green, O - Orange, P - Purple, R - Red, Y - Yellow, A - Assorted. Example: 3417B= 0.2ml tubes all Blue.

PCR Plates

Performance and versatility is what you have come to expect from MBP brands of plastic and you will find that our wide selection of plates for PCR is no exception. Molded under clean room conditions and 100% electrostatically tested for closure integrity, you can rest assured that these plates will fit snuggly inside your thermocyclers and decks of your automated liquid handling systems.

• Alpha-Numeric Grid for sample tracking • Exact hole placement for multi-channel pipetting • Bar Coding Option • Standard footprint for consistent fit • Elevated rims for sturdy non-flexing performance • Compatible with all major thermocyclers • Available in seven colors • White and Black plates for light sensitive applications • Bar Coding available



PCR Plates

Catalog Number	Volume	Description	Colors	Unit Packaging
A 96-well PCR Plates - Skirted				
3482		96-well PCR Plate - Skirted non-sterile	*Natural	1 pack of 50
B 96-well PCR Plates - Semi-skirted				
3484		96-well PCR Plate Semi-skirted non-sterile	*Natural	1 pack of 50
C 0.2ml Thin-wall PCR Plates				
3415	0.2ml	24-well PCR Thin Wall Plate	Natural	25 Individually wrapped plates
3421	0.2ml	32-well PCR Thin Wall Plate	Natural	25 Individually wrapped plates
3419	0.2ml	48-well PCR Thin Wall Plate	Natural	25 Individually wrapped plates
3416	0.2ml	96-well PCR Thin Wall Plate	Natural	25 Individually wrapped plates
D PCR Sealing Methods				
3418C	0.2ml	8 PCR Strip Dome Caps	Natural	10 bags of 12 strips
3481	TAPE	Adhesive Plate Sealing Tape	Clear	100 sheets

* Part numbers can be ordered in clear, black or white colors. Example 3482W = 96 Skirted Plate White

▶ Black and White Colored Plates Available for Light Sensitive Assays

"A common mistake that people make when trying to design something completely foolproof is to underestimate the ingenuity of complete fools."

Douglas Adams

Advanced PCR Products

MBP • SECTION 05

Index	Product	Page
1	RNase AWAY	76
2	DNA AWAY	76
3	HotStart	79
4	EasyStart	82

The fast, effective way to remove RNase and DNA contamination

Sure, the old methods of surface decontamination are effective, but are they really safe and practical? Extensive baking of glassware takes a lot of time and energy, while the carcinogenic properties of Diethylpyrocarbonate (DEPC) treatments require the donning of latex gloves and working under a fume hood. And, what about the countless items that cannot be autoclaved due to size or physical properties? MBP's decontaminants provide a safe, fast, and proven alternative to these arduous and time-consuming procedures. Our decontaminants can be used to remove nuclease and DNA contamination from bench tops, instruments, pipettors, glass, and plastic ware.

RNase AWAY®

RNase AWAY is easily wiped or rinsed away leaving your instruments and other surface areas residue free. For your convenience, RNase AWAY comes in four ready-to-use packaging configurations: 250ml, 1L and 4L bottles, as well as the ultra convenient 475ml spray bottle. You can spray, wipe, or soak your labware with RNase AWAY and remain confident your work is free of nuclease and nucleic acid contamination.

DNA AWAY®

DNA AWAY is the easiest and most effective method in the removal of nucleic acid contamination from PCR workstations, countertops and labware. DNA AWAY requires no prep time and is ready to use straight from the 250ml bottle.

	250ml bottle	475ml spray bottle	1L bottle	4L bottle
RNase AWAY	7000	7002	7003	7005
DNA AWAY	7010	-	-	-

For FREE samples, MSDS sheets, or Technical Report #205 on RNase AWAY®, please point your browser to www.mbpinc.com

1.800.995.2787 | 1.858.453.7551 | INFO@MBPINC.COM

HotStart PCR has never been this fast and easy

HotStart tubes are a combination of thin-walled tube and wax bead. The wax bead is pre-positioned in the tube to optimize the hot start reaction. HotStart's unique design eliminates the need for messy oil overlays and gives the researcher an advantage because the handling of the reaction tube is minimized, increasing the integrity of reaction conditions.

- Perform HotStart PCR with speed and simplicity
- Store pre-aliquoted master mixes for PCR and sequencing
- Eliminate mineral oil
- Complete RT-PCR in one tube

INCREASE YOUR YIELD AND SPECIFICITY

The HotStart PCR process involves withholding one or more key reagents until after the annealing temperature is reached. By assembling the final reaction at an elevated temperature, the occurrence of misprimes, primer-dimers, and premature annealing is decreased, thereby increasing sensitivity, specificity, and yield. HotStart storage and reaction tubes automate this process by using a pre-positioned wax barrier to separate key reagents until the annealing temperature is reached, thereby optimizing your reaction conditions.

The HotStart Process

STEP 1

- Add lower layer

STEP 2

- Maintain thermocycler at 90° C for 30 seconds to thoroughly melt wax. Allow wax to cool

STEP 3

- After wax cools add upper layer

STEP 4

- Complete all PCR cycles

STORE COMMONLY USED PRIMER SETS

HotStart storage and reaction tubes allow for the storage of commonly used primer sets and PCR product for later use or analysis. Simply create a master mix, aliquot into the HotStart tubes, melt the wax bead, and freeze! Master mixes and PCR product can be stored for months in this condition. This is a great way to save time and ensure test–to-test consistency when regularly running several of the same reacton types using identical primer sets.

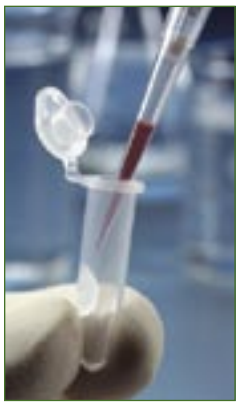
THE MOST ADVANCED SOLUTION FOR DIFFICULT PCR

Use HotStart storage and reaction tubes when working with low-copy-number samples, multiplex PCR, or hard-to-amplify DNA. The pre-adhered wax bead assures synchronous reaction start-up, consistent results, and eliminates the need for tedious mineral oil overlays. Pre-sterilized and RNase and DNase free, HotStart reaction tubes feature a thin–walled design assuring optimal heat transfer. HotStart PCR has never been this easy!

PERFORM RT-PCR IN ONE TUBE

HotStart's unique design facilitates a simple, one-tube RT-PCR procedure by using a thermostable reverse transcription enzyme. Simply add your reverse transcription reagents to the lower layer and the PCR reagents to the upper layer. The first denaturation cycle of PCR will melt the wax, denature any side reagents from the RT reaction and begin the amplification of the target cDNA. HotStart is the perfect, hassle-free alternative to standard RT-PCR protocols.

HotStart Storage Reaction tubes



HotStart PCR HAS NEVER BEEN THIS FAST AND EASY

- Pre-positioned wax bead and a thin-walled tube all in one!
- Perform HotStart PCR with speed and simplicity
- Store pre-aliquoted master mixes for PCR and sequencing
- Eliminate mineral oil
- Complete RT PCR in one tube

HotStart Storage Reaction tubes

Catalog Number	Product	Description	Unit Packaging
0.2ml HotStart Storage & Reaction Tubes			
6008	HotStart Micro 20 15-25µl reaction volume	.2ml reaction tube w/wax bead	96 tubes/reactions per pack
6308	HotStart Micro 20 15-25µl reaction volume	.2ml reaction tube w/wax bead	Bulk, 480 tubes/reactions per pack
▶ 6208	HotStart Micro 20 Strips 15-25µl reaction volume	.2ml 8-tube strips w/wax bead	96 tubes/reactions per pack strip dome caps included
▶ 6210	HotStart Micro 50 Strips 25-50µl reaction volume	.2ml 8-tube strips w/wax bead	96 tubes/reactions per pack strip dome caps included
6010	HotStart Micro 50 25-50µl reaction volume	.2ml reaction tube w/wax bead	96 tubes/reactions per pack
6310	HotStart Micro 50 25-50µl reaction volume	.2ml reaction tube w/wax bead	Bulk, 480 tubes/reactions per pack
6014	HotStart Micro 100 60-100µl reaction volume	.2ml reaction tube w/wax bead	96 tubes/reactions per pack
0.5ml HotStart Storage & Reaction Tubes			
6002	HotStart 50 25-50µl reaction volume	.5ml reaction tube w/wax bead	96 tubes/reactions per pack
6302	HotStart 50 25-50µl reaction volume	.5ml reaction tube w/wax bead	Bulk, 480 tubes/reactions per pack
6005	HotStart 100 60-100µl reaction volume	.5ml reaction tube w/wax bead	96 tubes/reactions per pack
6305	HotStart 100 60-100µl reaction volume	.5ml reaction tube w/wax bead	Bulk, 480 tubes/reactions per pack

▶ NOW AVAILABLE IN STRIP TUBES

One-step PCR With EasyStart PCR Mix-in-a-tube

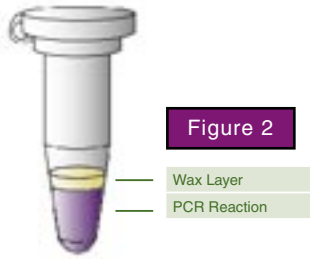
- **Fast, easy setup**
- **Enhanced performance with any standard Taq**
- **Contamination-free PCR**
- **Room temperature storage**
- **More economical than the alternatives**
- **Flexible - EasyStart works with numerous DNA polymerases**

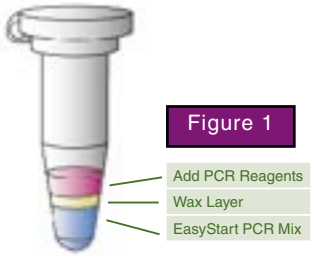
EASYSTART PCR MIX-IN-A-TUBE

EasyStart PCR mix-in-a-tube eliminates time-consuming setup protocols, while improving specificity and yield. We achieve this by pre-aliquoting the nonspecific reagents $MgCl_2$, 10xPCR buffer, dNTP mix, and dH_2O, then hermetically sealing them in a reaction tube. The 10x buffer is comprised of 200mM Tris-HCl (pH 8.4)/500mM KCl. A wax layer protects the reagents from oxidation, separating them from the reaction specific ingredients until the ideal reaction temperature is reached. EasyStart can also be stored at room temperature without negative effects.

EasyStart provides all the benefits of hot-start PCR without the time-consuming setup protocol. The tedium of aliquoting, the opportunity for contamination, the lack of consistency: all of the negative aspects of PCR are banished forever by MBP's EasyStart products. With this technology, it is only necessary to add your preferred Taq DNA polymerase, template DNA, and primers to begin the reaction.

All of the standard elements of PCR: dH_2O, dNTPs, 10X buffer, and $MgCl_2$, are pre-assembled and hermetically sealed under a layer of wax in a thin-wall PCR tube.





EASY TO USE

EasyStart eliminates the tedious first steps of PCR. All that is required is the addition of the reaction-specific reagents including template DNA, primers, enzyme, and dH_2O on top of the wax layer (figure 1). Now, begin the reaction by placing the EasyStart tube into a thermocycler making the first denaturation cycle between one and five minutes. The wax layer melts, mixing the ingredients at the ideal temperature, which significantly reduces the risk of misprimes, primer-dimers and premature annealing (figure 2), because the wax barrier separates the $MgCl_2$ from the enzyme until the wax barrier melts at the optimum reaction temperature. Additionally, high-quality control standards ensure that the lower layer mixture is precisely and consistently formulated in every tube to provide reproducible results every time.

DIFFERENT FROM OTHER MASTER MIXES

Unlike other brands of master mixes, EasyStart works with several DNA polymerases which allows labs to continue using their preferred enzyme. EasyStart has been tested with enzymes from Boehringer-Mannheim, Perkin-Elmer, Invitrogen, and Promega. In each case, the enzymes provided exceptional results.

STABLE STORAGE

EasyStart products can be safely stored at ambient temperatures for extended periods of time because the premixed portion is safely sealed beneath a wax barrier making it impossible for the reagents to oxidize or evaporate.

IDEAL FOR ANY APPLICATION

EasyStart tubes are thin-walled for optimal heat transfer and can be used in any 0.2ml or 0.5ml thermocycler including Perkin-Elmer, MJ Research, Eppendorf, ThermoHybaid, BioRad, Biometra and Techne. Both high- and low- volume labs will benefit from EasyStart's timesaving protocol and economical design. But, more significantly, increased specificity and yield will benefit any lab that depends on consistent results from hard-to-amplify DNA. Visit our Web-Site for free samples today!

EasyStart PCR Mix-in-a-tube

- **One-step protocol**
  Simply add reaction-specific reagents above EasyStart's wax layer to begin PCR.
- **Consistency**
  Every EasyStart tube has a precisely formulated lower-layer-reagent-mix to ensure batch consistency and reproducibility.
- **Versatility**
  EasyStart is available in 0.2 and 0.5ml tubes and strips, and available for 20, 50 and 100µl reactions.

EasyStart

Catalog Number	Product	Description	Unit Packaging
6028	EasyStart Micro 20 20µl reaction volume	.2ml ready-to-use PCR mix	96 tubes/reactions per pack
▶ 6228	EasyStart Micro 20 Strips 20µl reaction volume	.2ml 8 tube strips ready-to-use PCR mix	96 tubes/reactions per pack strip dome caps included
6020	EasyStart Micro 50 50µl reaction volume	.2ml ready-to-use PCR mix	96 tubes/reactions per pack
6024	EasyStart Micro 100 100µl reaction volume	.2ml ready-to-use PCR mix	96 tubes/reactions per pack
6022	EasyStart 50 50µl reaction volume	.5ml ready-to-use PCR mix	96 tubes/reactions per pack
6025	EasyStart 100 100µl reaction volume	.5ml ready-to-use PCR mix	96 tubes/reactions per pack

▶ NOW AVAILABLE IN STRIP TUBES

Pull the Pipet Straight Out

Pull the pipet straight out of the container after aspirating a sample. Do not touch the tip to the sides of the container.

This technique is especially important when pipetting small volumes (<5µl). Surface tension effects cause the sample volumes to vary if the exit angle varies. Touching the tip against the sides results in loss of sample.

"I love deadlines. I love the whooshing sound they make as they fly by."

Douglas Adams

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Microcentrifuge Tubes

MBP • SECTION 06

Index		Product	Page
1		Snap-cap centrifuge tubes	87
2		Locking lid centrifuge tubes	88
3		Screw-cap microcentrifuge tubes – conical	89
4		Screw-cap microcentrifuge tubes – freestanding	90
5		Caps and Closures	91
6		Microtiter tubes	92
7		Specialty tubes	93
	a.	0.25 tube w/cap	93
	b.	0.4 tube w/cap	93
	c.	Capless tubes	93

A Critical Component in Liquid Handling

Often when referring to liquid handling in the life-science laboratory, our discussions focus solely on pipet tips and pipettors and their precision and accuracy in delivering a sample. But, what about your reagent and reaction vessels? You almost never hear a discussion on that subject. The fact is that your micro-centrifuge tubes are usually the central element in your experiments. Not only are your reagents stored in them, your experiments take place in them, and then your results may be stored in them.

Manufacturing expertise and quality design that understands the technical applications is as important in producing microcentrifuge tubes as it is in producing pipet tips and pipettors. Material selection, wall-thickness, cap-to-tube interface, and thread-configuration will vary drastically depending on the specifically designed purpose and ultimate use of the tube. Within this section you will find a large variety of microcentrifuge tubes designed to meet your specific needs. Whether you require a transport vessel, a tube to withstand boiling or deep-freezing, or simply a tube whose lid can be opened easily with one hand, you will find it in this section of the catalog.

All of the HydroLogix microcentrifuge tubes in this catalog have been manufactured under the same stringent quality standards applied to our ART brand pipet tips. All tubes are certified RNase/DNase, RNA/DNA, ATP, and Pyrogen free, and we believe that there are no tubes better suited for the everyday rigors of the laboratory environment. We invite you to sample these tubes for free and see for yourself.

A

Rated 30kxG

B

Rated 26kxG

Designed to Protect the Integrity of your Product

- Quality Guarantee
- 4ml Puncture Proof Bag
- ZipLock™ closure for easy resealing
- 10 Individually sealed bags of tubes helps protect against cross contamination

Snap-Cap Centrifuge Tubes

Catalog Number	Product	Description	Unit packaging
A 0.6ml Microcentrifuge Tubes Plain w/Flat Cap no frosting or graduations			
▶ 3439	0.6ml MCT with Flat Cap	Clear, pre-sterilized	10 bags of 100 tubes
3439 A	0.6ml MCT with Flat Cap	Assorted, pre-sterilized	10 bags of 100 tubes
▶ 3440	0.6ml MCT with Flat Cap	Clear, non-sterile	10 bags of 100 tubes
3440 A	0.6ml MCT with Flat Cap	Assorted, non-sterile	10 bags of 100 tubes
B 1.5ml Microcentrifuge Tubes Plain w/Flat Cap no frosting or graduations			
▶ 3443	1.5ml MCT with Flat Cap	Clear, pre-sterilized	10 bags of 50 tubes
3443 A	1.5ml MCT with Flat Cap	Assorted, pre-sterilized	10 bags of 50 tubes
▶ 3444	1.5ml MCT with Flat Cap	Clear, non-sterile	10 bags of 50 tubes
3444 A	1.5ml MCT with Flat Cap	Assorted, non-sterile	10 bags of 50 tubes

▶ Colors: Specify desired color by adding the corresponding letter to the catalog number
B-Blue, G-Green, O-Orange, R-Red, Y-Yellow, A-Assorted

C

Rated 30kxG

D

Rated 26kxG

E

Rated 25kxG

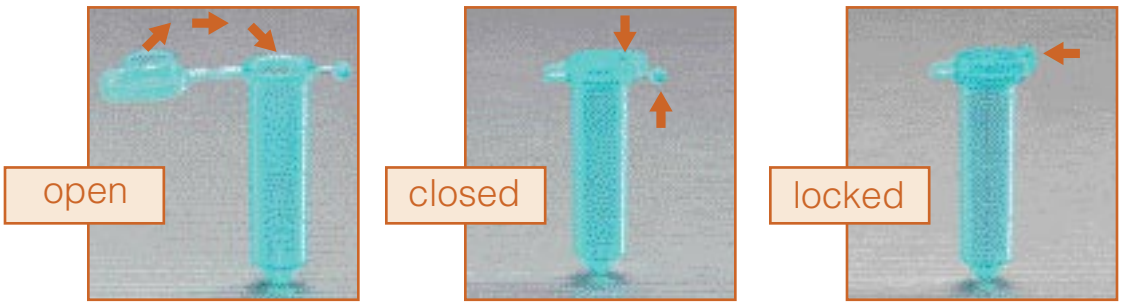
Snap-Cap Centrifuge Tubes

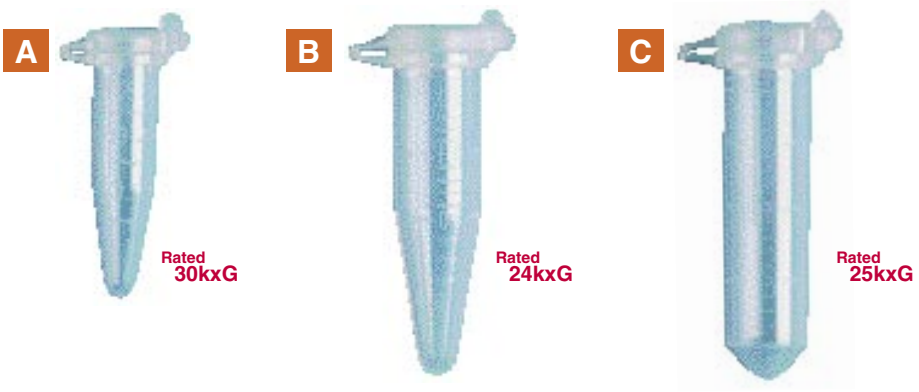
Catalog Number	Product	Description	Unit packaging
C 0.6ml Graduated Microcentrifuge Tubes w/Frosted Flat Cap and Side			
3446	0.6ml Graduated MCT with Flat Cap	Clear, non-sterile	10 bags of 100 tubes
3449	0.6ml Graduated MCT with Flat Cap	Clear, pre-sterilized	10 bags of 100 tubes
D 1.5ml Graduated Microcentrifuge Tubes w/Frosted Flat Cap and Side			
3448	1.5ml Graduated MCT with Flat Cap	Clear, non-sterile	10 bags of 50 tubes
3451	1.5ml Graduated MCT with Flat Cap	Clear, pre-sterilized	10 bags of 50 tubes
E 2.0ml Graduated Microcentrifuge Tubes w/Frosted Flat Cap and Side			
3434	2.0ml Graduated MCT with Flat Cap	Clear, non-sterile	10 bags of 50 tubes
3453	2.0ml Graduated MCT with Flat Cap	Clear, pre-sterilized	10 bags of 50 tubes

Colors: Specify desired color by adding the corresponding letter to the catalog number
B-Blue, G-Green, O-Orange, R-Red, Y-Yellow, A-Assorted

GRADUATED MICROCENTRIFUGE TUBES WITH SAFELOCK CAP

If you are looking for a superior locking cap, MBP's graduated microcentrifuge tubes with our exclusive 'Safelock' cap will become your tube of choice. These tubes feature an advanced locking system for safe and convenient centrifuging, boiling, freezing, incubation, or storage of samples for your most critical procedures. Only MBP's 'Safelock' can offer the same sample security as found with regular screw-cap tubes yet maintain the same ease of use as a standard snap- cap. The cap snaps closed, then the lock easily slips into place with one simple hand operation. The larger, rounder cap design provides more thumb contact while the smooth surface reduces the possibility of ripped or punctured gloves.





LOCKING LID CENTRIFUGE TUBES

	Catalog Number	Product	Description	Unit Packaging
	0.6ml Graduated Microcentrifuge Tubes w/Safelock Frosted Cap and Side			
A	3454	0.6ml Graduated MCT with Safelock Cap	Clear, non-sterile	10 bags of 100 tubes
	3455	0.6ml Graduated MCT with Safelock Cap	Clear, pre-Sterilized	10 bags of 100 tubes
	3455IW	0.6ml Graduated MCT with Safelock Cap	Clear, Individually Wrapped pre-sterilized	500 tubes
	1.5ml Graduated Microcentrifuge Tubes w/Safelock Frosted Cap and Side			
B	3456	1.5ml Graduated MCT with Safelock Cap	Clear, non-sterile	10 bags of 50 tubes
	3457	1.5ml Graduated MCT with Safelock Cap	Clear, pre-sterilized	10 bags of 50 tubes
	3457IW	1.5ml Graduated MCT with Safelock Cap	Clear, Individually Wrapped pre-sterilized	500 tubes
	2.0ml Graduated Microcentrifuge Tubes w/Safelock Frosted Cap and Side			
C	3458	2.0 Graduated MCT with Safelock Cap	Clear, non-sterile	10 bags of 50 tubes
	3459	2.0 Graduated MCT with Safelock Cap	Clear, pre-sterilized	10 bags of 50 tubes
	3459IW	2.0 Graduated MCT with Safelock Cap	Clear, Individually Wrapped pre-sterilized	500 tubes

Colors: Specify desired color by adding the corresponding letter to the catalog number
B-Blue, G-Green, O-Orange, R-Red, Y-Yellow, A-Assorted

CONICAL AND FREE-STANDING MICROCENTRIFUGE TUBE WITH SCREW-CAP & O-RING

These first-class conical microcentrifuge tubes are made from a crystal clear resin that easily allows you to view your samples. Made from the highest quality polypropylene, these tubes are suitable for vapor phase liquid nitrogen storage, boiling, and autoclaving and are sturdy enough to withstand centrifugation of 20,000 x G. External ribs on the free-standing tubes position and lock the tubes into place in racks with serrated holes allowing for single-handed opening and closing. Conical bottoms allow for more complete sample retrieval while our superior O-ring design forms a positive seal against the rim of the screw-cap to guard against leakage. These popular conical and free-standing tubes are available in 0.5ml, 1.5ml, and 2.0ml sizes. Available in clear or in an amber color for light-sensitive applications, these tubes are free of RNase, DNase, and endotoxins.

A

Rated 25kxG

B

Rated 20kxG

C

Rated 20kxG

WHAT IS THE DIFFERENCE BETWEEN RPM AND RCF(XG) WITH REGARD TO TUBES?

RPM stands for "Revolutions per minute." The rotor, regardless of its size, is revolving at that rate. The force applied to the contents varies by the size of the centrifuge rotor. RCF (relative centrifugal force) is measured in force x gravity, or g-force. This is the force exerted on the contents of the rotor, resulting from the revolutions of the rotor. It is RCF, not RPM that separates aqueous solutions in the centrifuge. RCF can be calculated for any centrifuge by this equation: RCF = $(1.118 \times 10^{-5})(r)(RPM)^2$ (where "r" is the radius of the rotor in cm).

SCREW-CAP MICROCENTRIFUGE TUBES - CONICAL

	Catalog Number	Product	Description	Unit Packaging
	0.5ml Conical Microcentrifuge Tube w/Screw-Cap			
A	3460	0.5ml Conical MCT with Screw-Cap & O-Ring, Unattached	Clear, non-sterile	10 bags of 50 tubes
	3460A	0.5ml Conical MCT with Screw-Cap & O-Ring, Unattached	Amber, non-sterile	10 bags of 50 tubes
	3431	0.5ml Conical MCT with Screw-Cap & O-Ring, Attached	Clear, pre-sterilized	10 bags of 50 tubes
	3431A	0.5ml Conical MCT with Screw-Cap & O-Ring, Attached	Amber, pre-sterilized	10 bags of 50 tubes
	3462	0.5ml Conical MCT w/out Cap	Clear, non-sterile	10 bags of 50 tubes
	1.5ml Conical Microcentrifuge Tube w/Screw-Cap			
B	3464	1.5ml Conical MCT with Screw-Cap & O-Ring, Unattached	Clear, non-sterile	10 bags of 50 tubes
	3464A	1.5ml Conical MCT with Screw-Cap & O-Ring, Unattached	Amber, non-sterile	10 bags of 50 tubes
	3461	1.5ml Conical MCT with Screw-Cap & O-Ring, Attached	Clear, pre-sterilized	10 bags of 50 tubes
	3461A	1.5ml Conical MCT with Screw-Cap & O-Ring, Attached	Amber, pre-sterilized	10 bags of 50 tubes
	3466	1.5ml Conical MCT w/out Cap	Clear, non-sterile	10 bags of 50 tubes
	2.0ml Conical Microcentrifuge Tube w/Screw-Cap			
C	3468	2.0ml Conical MCT with Screw-Cap & O-Ring, Unattached	Clear, non-sterile	10 bags of 50 tubes
	3468A	2.0ml Conical MCT with Screw-Cap & O-Ring, Unattached	Amber, non-sterile	10 bags of 50 tubes
	3463	2.0ml Conical MCT with Screw-Cap & O-Ring, Attached	Clear, pre-sterilized	10 bags of 50 tubes
	3463A	2.0ml Conical MCT with Screw-Cap & O-Ring, Attached	Amber, pre-sterilized	10 bags of 50 tubes
	3470	2.0ml Conical MCT w/out Cap	Clear, non-sterile	10 bags of 50 tubes
	ORDER colored caps separately. See srew-cap page of this section.			

A

Rated
30kxG

B

Rated
18kxG

C

Rated
18kxG

Screw-Cap Microcentrifuge - Freestanding

Catalog Number	Product	Description	Unit packaging
0.5ml Free-standing MC Tube with Screw-Cap			
A 3472	0.5ml Freestanding MCT with Screw-Cap & O-Ring, Unattached	Clear, non-sterile	10 bags of 50 tubes
3472A	0.5ml Freestanding MCT with Screw-Cap & O-Ring, Unattached	Amber, non-sterile	10 bags of 50 tubes
3465	0.5ml Freestanding MCT with Screw-Cap & O-Ring, Attached	Clear, pre-sterilized	10 bags of 50 tubes
3465A	0.5ml Freestanding MCT with Screw-Cap & O-Ring, Attached	Amber, pre-sterilized	10 bags of 50 tubes
3422	0.5ml Freestanding MCT w/out Cap	Clear, non-sterile	10 bags of 50 tubes
1.5ml Freestanding MC Tube with Screw-Cap			
B 3474	1.5ml Freestanding MCT with Screw-Cap & O-Ring, Unattached	Clear, non-sterile	10 bags of 50 tubes
3474A	1.5ml Freestanding MCT with Screw-Cap & O-Ring, Unattached	Amber, non-sterile	10 bags of 50 tubes
3467	1.5ml Freestanding MCT with Screw-Cap & O-Ring, Attached	Clear, pre-sterilized	10 bags of 50 tubes
3467A	1.5ml Freestanding MCT with Screw-Cap & O-Ring, Attached	Amber, pre-sterilized	10 bags of 50 tubes
3478	1.5ml Freestanding MCT w/out Cap	Clear, non-sterile	10 bags of 50 tubes
2.0ml Freestanding MC Tube with Screw-Cap			
C 3488	2.0ml Freestanding Graduated MCT with Screw-Cap & O-Ring, Unattached	Clear, non-sterile	10 bags of 50 tubes
3488A	2.0ml Freestanding Graduated MCT with Screw-Cap & O-Ring, Unattached	Amber, non-sterile	10 bags of 50 tubes
3469	2.0ml Freestanding Graduated MCT with Screw-Cap & O-Ring, Attached	Clear, pre-sterilized	10 bags of 50 tubes
3469A	2.0ml Freestanding Graduated MCT with Screw-Cap & O-Ring, Attached	Amber, pre-sterilized	10 bags of 50 tubes
3490	2.0ml Freestanding Graduated MCT w/out Cap	Clear, non-sterile	10 bags of 50 tubes
ORDER colored caps separately see srew-cap page of this section.			

SCREW-CAPS: O-RING & PLUG CLOSURES

MBP's special O-ring screw cap is manufactured from autoclavable polyethylene and polypropylene which forms a positive seal against the rim of the tube to ensure against leakage even under the most demanding conditions. Available in a variety of colors, these screw caps adapt to both your everyday and critical scientific experiments.

MBP's plug caps are ideal for routine laboratory analysis and procedures. The low-density polyethylene plug caps are the perfect match to MBP's capless microcentrifuge tubes. Available in a size that accommodates both 1.5ml and 2.0ml capless tubes, they are perfect for collecting fractions and mixing reagents. These plug closures are not autoclavable.

Caps for Microcentrifuge Tubes

Catalog Number	Product	Description	Unit Packaging
A Screw-Cap w/O-ring for Microcentrifuge Tubes			
3471	Screw-Cap with O-Ring	Natural, non-sterile	10 bags of 50 caps
3471R	Screw-Cap with O-Ring	Red, non-sterile	10 bags of 50 caps
3471O	Screw-Cap with O-Ring	Orange, non-sterile	10 bags of 50 caps
3471B	Screw-Cap with O-Ring	Blue, non-sterile	10 bags of 50 caps
3471G	Screw-Cap with O-Ring	Green, non-sterile	10 bags of 50 caps
3471Y	Screw-Cap with O-Ring	Yellow, non-sterile	10 bags of 50 caps
3471A	Screw-Cap with O-Ring	Amber, non-sterile	10 bags of 50 caps
B Plug Closures			
3475	Plug Closures for 1.5ml & 2.0ml Capless MCT	White, non-sterile	10 bags of 100 caps

The Amber Advantage

AMBER tubes are available in all sizes both Conical and Free Standing, so when you are working with light sensitive applications you can rely on HLT branded Amber tubes to block out that destructive light keeping your sensitive samples protected.

On the graph below both resins, amber and clear, transmit UV light starting at about 200 nm to 270 nm. The clear resin transmits light throughout the 200 to 800 nm range, however the amber resin had virtually 0% transmission from 270 to 600 nm. Amber resin UV light transmission slightly increases from 0% to only 5% when approaching the 600 to 800 nm range.

The graph was generated by using a spectrophotometer on a blank slide with the resins compressed to less than the thickness of paper.

MICROTITER TUBE SYSTEMS

MBP's line of MicroTiter tubes supplies you with benefits other companies can't match. Each MicroTiter tube system is available pre-racked in an 8x12 format and can be autoclaved, sealed, and frozen for storage. These tubes offer additional volume capacity for sample dilution and/or mixing prior to procedures such as HTLV-III testing, RIA, EIA, PCR, pharmaceutical quality control, blood bank sample freezer storage, or transport of specimens and reagents. With frosted writing areas on each tube, identification and organization are simplified. Available in bulk packaging, or in a robotic workstation-compatible tip rack, these microtiter tubes can be easily integrated into experiments on your Beckman, Tecan, Tomtec or other automated liquid handling workstations. A low density Polyethylene Cap strip is used to seal these tubes. They can be used with rows of tubes or easily cut apart for individual samples. They are available non-sterilized or pre-sterilized as the material will not withstand autoclaving. Only MBP can bring such innovation to your ever-evolving technical needs.

A

B

MICROTITER TUBES

	Catalog Number	Product	Description	Unit Packaging
	1.2ml MicroTiter Tube			
A	3496	1.2ml MicroTiter Tube, Robotic Rack	Clear, non-sterile	96 tubes/tray 10 trays/pack
	3487	1.2ml MicroTiter Tube, Robotic Rack	Clear, pre-sterilized	96 tubes/tray 10 trays/pack
	3492	1.2ml MicroTiter Tube Bulk	Clear, non-sterile	1000 tubes
	1.2ml MicroTiter Tube Frosted			
B	3489	1.2ml Frosted MicroTiter Tube, Robotic Rack	Clear, pre-sterilized	96 tubes/tray 10 trays/pack
	3424	1.2ml Frosted MicroTiter Tube, Robotic Rack	Clear, non-sterile	96 tubes/tray 10 trays/pack
	3498	1.2ml Frosted MicroTiter Tube Bulk	Clear, non-sterile	1000 tubes
	MicroTiter Cap Strips - Non Autoclavable			
C	3426	8 Cap Strips	Nature, non-sterile	10 bags of twelve 8 Cap Strips
	3425	8 Cap Strips	Nature, pre-sterilized	10 bags of twelve 8 Cap Strips

SPECIALTY MICROCENTRIFUGE TUBES

Our small-volume, specialty, microcentrifuge tubes are dedicated for lesser sample sizes, and offer a unique combination of quality and features that make this the small-volume-protocol tube of choice. MBP's 0.4ml and 0.25ml size microcentrifuge tubes have an attached snap-seal closure that provides a leak-tight seal. Specially formulated translucent low-density polyethylene provides an excellent view of sample contents, and makes the 0.4ml tube material much softer and easier to cut for pellet removal. These tubes feature a nonwettable surface and smooth interior to aid in complete sample removal and recovery. Choose MBP for all of your specialty experiment needs.

Rated 30kxG

A 

B 

Specialty Tubes

	Catalog Number	Product	Description	Unit Packaging
A	3483	0.25ml Polypropylene Tube & Cap	Clear, non-sterile	10 bags of 100 Tubes
B	3485	0.4ml Polyethylene Tube & Cap	Clear, non-sterile, non-autoclavable	10 bags of 100 Tubes

CAPLESS, GRADUATED MICROCENTRIFUGE TUBES

MBP's capless clear graduated microcentrifuge tubes offer the same superior quality, crystal-clear polypropylene as our microtubes with caps, but these offer the versatility for those experiments where caps are not needed and storage is not required. The tube has an ultra-smooth bottom that allows for 100% visibility and full sample recovery. The tube also comes with graduations and a frosted, side-area for writing.

C 

Rated 26kxG

Capless, Graduated Microcentrifuge Tubes

	Catalog Number	Product	Description	Unit Packaging
C	3479	1.5ml Graduated MCT, Capless	Natural, non-sterile	10 bags of 100 Tubes

Use Cap Closure #3475 for the 1.5 and Capless Tubes.

"A scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it."

Maxwell Planck

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Storage Racks

MBP • SECTION 07

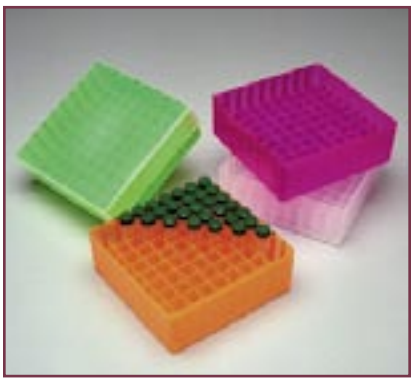
Index		Product	Page
1		Cryogenic storage racks	97
2		Bench top storage racks	
	a.	4-way flipper racks	97
	b.	96-well flipper racks	98
	c.	Reversible microtube racks	98
	d.	Flipstrip microtube racks	99

Making the Most of Your Bench Space

Whether you are in an academic, Biotech, or Pharmaceutical research environment, bench space always seems to be at a premium. One of the easiest ways to organize the use of laboratory work space is through the proper utilization of storage and transport racks while conducting your experiments.

Molecular BioProducts is pleased to offer eight different styles of rugged, heavy duty racks designed for freezer and liquid nitrogen storage, as well as bench top racks designed for the organization of reagent vessels used in everyday experiments. Available in a variety of bright, vivid, and exciting colors, these racks are guaranteed to provide you with a little extra “elbow room” while spicing up your lab.

81-Well Cryogenic Rack with Lid



The standard for cryogenic storage, our 81-well rack is designed to work with all 0.5, 1.5, and 2.0ml cryovials. This 9x9 matrix rack is designed to replace the 5 1/4 x 5 1/4 inch cardboard freezer storage boxes. The storage rack holds up to 81 tubes and comes complete with a clear polypropylene lid and large, easy to read alphanumeric labels. Available in natural and three fluorescent colors.

Cryogenic Storage Racks

Catalog Number	Description	Color	Unit Packaging
81-Well Cryogenic Storage Racks with Lids			
8800	81-well cryogenic rack with lid	Natural	1
8810	81-well cryogenic rack with lid	Fluorescent Green	1
8820	81-well cryogenic rack with lid	Fluorescent Orange	1
8830	81-well cryogenic rack with lid	Fluorescent Pink	1

4-Way FLIPPER™ Racks

The 4-way FLIPPER is the ultimate bench top storage system combining four great racks in one! Designed to support a variety of tube sizes and styles, each rack can be rotated to any of the four sides to support different size centrifuge tubes. Constructed of rugged polypropylene, these racks are autoclavable, may be placed in a freezer, or used in waterbaths. Regardless of the support position used, the 2x7 inch or the 3 1/2x8 inch format is small enough to be conveniently used under the hood or on the benchtop. This rack will hold four 50ml conical tubes, twelve 15ml conical tubes, thirty-two 1.5/2.0ml micro-centrifuge tubes, and thirty-two 0.5ml microtubes.

4-Way Flipper Rack

Catalog Number	Description	Color	Unit Packaging
8850	4-Way FLIPPER Rack	Fluorescent Green	1
8860	4-Way FLIPPER Rack	Fluorescent Orange	1
8870	4-Way FLIPPER Rack	Fluorescent Pink	1

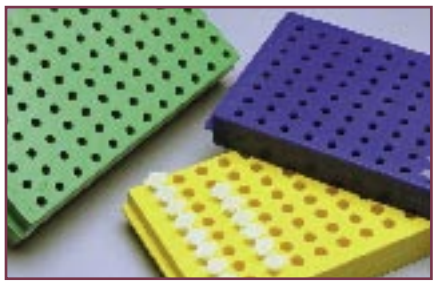
96-Well FLIPPER® Microtube Racks

The FLIPPER microtube rack is designed to hold either 96 0.5ml or 96 1.5/2.0ml style microcentrifuge tubes. The rack is uniquely designed to be reversible, with one side suitable for larger tubes and the other side suitable for smaller microtubes. The FLIPPER is fitted with a clear polypropylene lid and both sides are labeled in standard alphanumeric microtiter format. All four sides have a frosted writing surface for smear resistant labeling.

96-Well Flipper Racks with Lids

Catalog Number	Description	Color	Unit Packaging
8760	96-well FLIPPER Rack w/lid	Fluorescent Pink	1
8770	96-well FLIPPER Rack w/lid	Fluorescent Orange	1
8780	96-well FLIPPER Rack w/lid	Fluorescent Green	1
8790	96-well FLIPPER Rack w/lid	Red	1

The Reversible Microtube Rack: Two Racks in One



Specifically designed for researchers performing PCR, this unique 96-well rack is reversible with either side of the rack being utilized, saving space and money. Use one side to hold 0.2ml PCR tubes or flip it over and use the other side for 0.5ml micro-centrifuge or PCR tubes. Both sides feature a molded alphanumeric grid in standard microtiter format to simplify identification.

Reversible Microtube Racks with Lids

Catalog Number	Description	Color	Unit Packaging
8600	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Assorted - three each: red, blue, yellow, green	12
8601	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Assorted - three each: fl.green, fl.pink, fl.orange, purple	12
8620	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Green	1
8630	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Blue	1
8640	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Purple	1
8650	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Yellow	1
8660	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Fluorescent Pink	1
8670	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Fluorescent Orange	1
8680	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Fluorescent Green	1
8690	96-Well Reversible Rack Fits: 96 0.2ml or 0.5ml microtubes	Red	1

FLIPSTRIP™ MICROTUBE RACKS WITH LIDS

Designed to hold 0.2ml 8-strip PCR tubes as well as 0.5ml, 1.5ml or 2.0ml reagent vials on one side, this reversible rack is ideal for any researcher utilizing strip tubes for PCR. When using only 0.5ml tubes, flip the rack over and there are 96 alpha numerically labeled 0.5ml wells for easy sample manipulation. Available in a variety of standard and fluorescent colors, FlipStrip racks come complete with a snug fitting lid.

FlipStrip Microtube Racks with Lids

Catalog Number	Description	Color	Unit Packaging
8608	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Assorted -3 each: red, blue, yellow, green	12
8618	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Assorted -3 each: fl.green, fl.pink, fl.orange, purple	12
8628	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Green	1
8638	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Blue	1
8648	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Purple	1
8658	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Yellow	1
8668	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Flourescent Pink	1
8678	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Flourescent Orange	1
8688	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Flourescent Green	1
8698	Reversible rack with lid - 1 side fits 12 - 1.5ml and 12 - 8 strip PCR Tubes,1 side fits: 96 - .5ml PCR Tubes	Red	1

Pause Consistently after Aspiration

Pause with the tip in the liquid for one or two seconds after aspirating the sample.

The amount of liquid in the tip “bounces” slightly when the plunger stops. Slow, even plunger release and a consistent, brief pause after aspiration minimize errors resulting from this phenomenon.

"Science is wonderfully equipped to answer the question 'How?' but it gets terribly confused when you ask the question 'Why?'"

Erwin Chargaff

Electroporation Cuvettes

MBP • SECTION 08

Index	Product	Page
1	Electroporation Cuvettes (1, 2 & 4mm)	103

Electroporation Cuvettes

Every day around the world, scientific experiments are conducted with electroporation devices in order to introduce DNA into bacterial cells, yeast cells, and mammalian cells in the search for new medical treatments and vaccines. Reproducible electroporation results require the use of high-quality electroporation cuvettes for consistent pulse delivery to your valuable samples in your toughest research experiments.

The precision pulse output required by many top electroporation systems is matched only by MBP's superior quality cuvette construction. During our comprehensive manufacturing process, MBP's cuvettes are thoroughly cleansed to eliminate trace inhibitor materials and then electronic beam irradiated for sterilization. In order to provide further contamination control, MBP then packages the individually wrapped cuvettes in exclusive, single-use packaging. The enhanced snug-fit caps on each cuvette also ensure the maximum sterility level possible. Additionally, MBP's cuvettes are inspected and tested at several points in the manufacturing process to guarantee reproducible results. You will find a pre-sterilized transfer pipet packaged with each MBP cuvette.

MBP Cuvettes

Ease-of-use is made possible with color-coded, frosted caps for trouble-free labeling and recognition. The sturdy construction of the durable polycarbonate can withstand pulses of very high voltages or field strength. Precise gap tolerances are set for reproducible field strength delivery and high transformation efficiency. The consistent chamber shape made from seamless plastic molding eliminates leaking and keeps the aluminum plates parallel for uniform sample treatment and safety. To try these for yourself, contact our customer service team or log on to www.mbpinc.com

- 1mm (white cap) – delivers pulses with the highest field strength and is perfect for bacterial cells.
- 2mm (blue cap) – generates pulses at medium field strength and works well for yeast cells.
- 4mm (green cap) – produces pulses with the lowest field strength, which is best suited for mammalian cells

Electroporation Cuvettes

Catalog Number	Product	Description	Unit packaging
5510	1mm gap	pre-sterilized, White cap	50 cuvettes, individually wrapped w/Samco transfer pipet
5520	2mm gap	pre-sterilized, Blue cap	50 cuvettes, individually wrapped w/Samco transfer pipet
5540	4mm gap	pre-sterilized, Green cap	50 cuvettes, individually wrapped w/Samco transfer pipet

Minimize Handling of the Pipet and Tip

Set the pipet down between sample deliveries and avoid handling the tip.

Body heat transferred to equipment during handling disrupts temperature equilibrium. As explained in Tip #2, the volume of sample delivered varies with temperature.

"I have a hunch that the unknown sequences of DNA will decode into copyright notices and patent protections"

David E Knuth

Reference Information

MBP • Section 09

Index	Reference Information	Page
	Index	106
	Glossary	108
Appendix A:	Automated Instrumentation Section	
	A.1: Perkin-Elmer BioRobotix Troubleshooting	115
	A.2: MBP Beckman Biomek FX 10µl Tip Set-up	116
	A.3: MBP Beckman Biomek FX 20µl Tip Set-up	117
	A.4: MBP Beckman Biomek FX 200µl Tip Set-up	118
	A.5: Suggestions for Deck Positioning on the Beckman Biomek FX	119
Appendix B:	10 Tips to Improve your Pipetting Technique	121
Appendix C:	%CV and Accuracy Sample Delivery	122
Appendix D:	Units, Metric Prefixes, Conversion Factors, pH Values, and Symbols	123
Appendix E:	Chemicals (Acids and Bases) and Isotopes	125
Appendix F:	Troubleshooting and Solutions to Pipetting Errors	126
Appendix G:	DNA & Nucleotide Molecular Weight Conversions	127
Appendix H:	Protein Conversions	128
Appendix I:	ART Pipettor Fits Chart	130
Appendix J:	HLT Pipettor Fits Chart	137
Appendix K:	Packaging Configurations	146

2005 Catalog Index

A
ART (Aerosol Resistant Tips).....8-22
ART Ergonomic Tips.....13-15
ART Lite-Touch (LTS) Tips.....13
ART Low Retention Tips.....17
ART Re-loading System.....9
ART REACH Tips.....21
Automated Workstation Tips.....52-67

B
Barrier Tips.....See ART
Beckman Tips.....57-60
Bench Top Storage Racks 97-100
Biomek Tips 57-60
BioRobot Tips.....67
BioRobotix Tips.....52-67
Bulk Microcentrifuge Tubes.....87-92
Bulk PCR Tubes.....71-73
Bulk Tips.....8-11, 21, 28-32, 37-38,41-44

C
Caps, PCR Tubes.....72-73
Caps, Microcentrifuge.....91
Cavro Tips.....52-54
CCS 384-well Tips.....63
CCS 96-well Tips.....63
Centrifuge Tube Closures 91
Centrifuge Tube Racks.....97-100
Centrifuge Tubes.....87-92
Closures.....72-73, 91
Coefficient of Variance, Percent (%CV).....122
Conductive Tips.....52-53, 57, 61,66-67
Conical Centrifuge Tubes 89
Cross Reference.....130-147
Cryogenic Storage Racks 97
Crystal Tips 8-9, 17, 28
Cuvettes.....103

D
DNA Away.....75
Dome Cap PCR Tubes.....71-72

E
EasyStart Kits.....82
Econo Packaging Tips.....9, 28-29, 31, 52, 61, 67
Electroporation Cuvettes.....103
Environmental Packaging 9, 28-29, 31, 52, 61, 67
Ergo Tips.....13-15, 34-36
Ergonomic Tips.....16-15, 34-36
Evolution P-3 Tips.....63
Extended Length Tips.....21, 41

F
Filter Tips .....See ART
FinnPipet Style Tips.....15, 35
Fits Chart.....130-147
Flat Cap PCR Tubes.....71-72
Flipper Racks.....98
FLIPR Tips.....64
Free-Standing Centrifuge Tubes.....90
Freezer Racks.....97
FX Tips.....57, 59

G
Gel Loading Tips.....18, 39-40
Genesis Tips.....52-54
GenMate Tips.....55
Genomic Tips (Wide Bore).....19, 42, 53, 57, 65
Gilson Ergonomic Tips.....14, 36
Graduated Centrifuge Tubes.....87-88, 90, 92
"Green" Packaging.....9,26-29, 31, 52, 61, 67

H
Hanging Tips.....61-62
HotStart Kit.....79
HydroLogix Lite-Touch (LTS) Tips.....34
HydroLogix Low Retention Tips 37-38
HydroLogix Re-loading System 28-29, 31
HydroLogix REACH Tips.....41

I
Individually Wrapped Tips.....8-11, 19
Instructions & Protocols.....117-122

J

K

L
Lab Automation Tips.....52-67
Large Orifice Tips.....19, 42, 53, 57,65
Liberty 384-well Tips.....64
Liquid Handling Workstation Tips.....52-67
Liquid Sensing Tips.....52-53, 57, 61, 66-67
Locking Lid Centrifuge Tubes.....88
Low Retention Tips.....17, 37-38, 59-60
Low Retention Beckman Tips.....60
Lite-Touch (LTS) Pipet Tips.....13
Lite-Touch (LTS) Low Retention Pipet Tips.....13

M
Matrix Tips.....44
Microcentrifuge Tubes.....87-92
Microcentrifuge Tube Closures.....91
Microcentrifuge Tube Racks.....97-100
Microcentrifuge Caps.....91
Minitube System.....93
MiniTrak Tips.....63
Molecular Biology Tables & Charts.....123-128
Molecular Devices Tips.....64
Multi-Channel Tips.....9-10, 30
Multimek Tips.....57, 59-60
MultiPROBE Tips.....61-62

N
Non-sterile Tips.....28-33, 35-44
Non-sterile Tubes.....87-93

O
O-ring Caps.....91
O-ring Cap with Tubes.....89-90

P
Packard Tips.....61-63
Perkin-Elmer Tips.....61-63
PCR Plates.....73
PCR Racks.....99-100
PCR Tubes.....71-72
PCR Strip-Tubes.....72
Pipet Tips.....8-12, 13-15, 17-19, 21-22, 28-33, 35-44
Pipettor Comatibility Table.....130-149
Plates.....73
PlateTrak Tips.....63
Plug Tips.....8-12, 13-15, 17-19, 21-22
Pre-sterilized Tips.....8-12, 13-15, 17-19, 21-22
Pre-sterilized Tubes.....87-90, 92-93
Pre-sterilized Cuvettes.....106
Protocols.....117-120

Q
Qiagen Tips.....67

R
Racks.....97-100
RapidPlate Tips.....65-66
REACH Tips 21, 41
Reloading Tip Systems.....9, 28-29, 31, 52, 62, 67
Reversable MicroTube Racks.....98-100
RNase AWAY.....76
Robotic Tips 52-67
Robotic Troubleshooting.....117-120
Rosys Tips.....67

S
Safe-lock Centrifuge Tubes.....88
Samples.....II
Sci-clone Tips.....65-66
Screw-cap Centrifuge Tubes.....89-90
Sealing Mats.....73
Semi-skirted PCR Plates.....76
Skirted PCR Plates.....73
Snap-cap Centrifuge Tubes.....87-88
Solvent Safe Tips.....22
Solvents.....76
Span-8 Tips.....58
Specialty Tips.....18-22, 39-44
Stack Rack Tips.....9, 28-29, 31, 52, 61, 67
Standard Wall PCR Tubes.....71
Sterile Tubes.....87-93
Sterile Tips.....8-12, 13-15, 17-18, 21-22, 28-33, 35-44
Strip Tubes.....72
Storage Racks.....97-100

T
Tecan Tips.....52-56
TEMO Tips.....56
Technical References.....117-121
Technical Reports.....117-121
Tempo Style Tips.....56
Testing Procedures.....117-121
Test Tube Racks.....98
Thin-wall PCR Tubes.....71-73
Titertek Style Tips.....43
Troubleshooting.....117-121, 126
Tubes.....87-93
Tube Closures.....91
Tubes, Microcentrifuge.....87-92
Tube Racks.....97-100
Tubes, Snap Cap.....87
Tubes, Locking Lid.....88
Twister Loading System Tips.....65

U
Ultra Micro Tips.....8, 17, 28, 39

V

W
Website.....II
Wide-bore Tips.....19, 42, 53, 57, 65
Wide Orifice Tips.....19, 42, 53, 57, 65
Workstation Tips.....52-67

X

Y

Z
Zymark Tips.....65-66

2005 Catalog Glossary of Terms

% CV – Percentage coefficient of variation. It is a measure of accuracy and precision from tip to tip. MBP performs %CV testing on every lot of BioRobotix brand product.

384-well – BioRobotix tips that fit a 384 channel head workstation.

96-well – BioRobotix tips that fit a 1, 4, 8, or 96 channel-head workstation.

Accuracy – How comparable each tip is to another in a tip rack and in a manufactured lot of product. Accuracy is measured by performing %CV testing. MBP performs %CV accuracy tests on every lot of BioRobotix product.

Aerosol Resistant Tips – The longhand of ART tips. Molecular BioProduct's ART tips have a unique patented self-sealing filter that prevents aerosols and liquids from contaminating pipettors as well as preventing carryover contamination in samples. MBP is the only company that can offer this kind of protection and guarantee it 100%.

ART/ART Barrier – Aerosol Resistant Tips. ART tips have a unique, patented, self-sealing filter that prevents aerosols and liquids from contaminating pipettors as well as preventing carryover contamination in samples. Only Molecular BioProducts can offer you this unique technology in a patented tip.

Automated Workstation Tips – Pipet tips that are used to aspirate and dispense liquids on a liquid handling robotic machine. These are also referred to as MBP's BioRobotix brand of tips. Molecular BioProducts has the most extensive offering of automated workstation tips on the market today, with a tip to fit any major workstation manufacturer.

Beveled Tip – A tip that has a sloping or slanted orifice edge, whereas a micro-point tip orifice profile is 50% smaller. Due to the increased surface area of a beveled tip, this may affect precision, especially when working with low-volume samples. For this reason, ART tips have a unique micropoint design to allow the most sample accuracy.

BioRobotix – MBP's brand of tips for automated workstations. BioRobotix tips are tested during manufacture and before final lot release on 15 quality control parameters and is the most extensive line of tips for automated workstations that is on the market today.

Blister Pack – See-through packaging found in MBP's BioRobotix product line that forms a hermetically sterile seal and protects the tips during shipment from bending or breaking. Only Molecular BioProducts can offer you this kind of protection.

BreakThru – Novel, new, environmentally friendly refill packaging from MBP that allows use of only one standard rack that can be refilled 10 times. As the plate holding the tips is pushed down on this refill packaging, the tips break through the holes into the standard tray, thus the name BreakThru. These tips are listed in our HydroLogix section.

Bulk – tips that are sold in a bag instead of in a racked tray. This provides more tips per unit of product. This is just one of the many packaging configurations of our ART and HydroLogix brand tips.

Carryover-Contamination – Sample contamination that can occur when aerosols or liquids from one sample are inadvertently carried to the next sample. Tips with the patented ART filter prevent this from occurring.

Centrifuge Tubes – Thick walled tubes that are used to hold samples that can with stand medium velocity centrifugation.

Certified Pure – Tips and tubes that have been certified by a third-party laboratory to be RNase, DNase, Pyrogen, and ATP free. All sterile tips and tubes sold by MBP have this certification.

Certified Robotic Tips – Tips for automated workstations that have been formally approved and certified for use by the original manufacturer of the workstation. Many of MBP's BioRobotix brand tips carry this certification.

Clear Tips – Tips made of 100% virgin polypropylene that are crystal clear and have no added color such as blue or yellow.

Conical Tube – An elongated round tube with a pointed (conical) bottom. These tubes can be used in centrifugation and allow for more complete sample retrieval. MBP sells a large variety of these tubes.

Cross-Contamination – When successive samples are contaminated due to use of a pipettor that has been contaminated from aerosols or liquids from another sample. Tips with the patented ART filter prevent this from occurring.

Cryogenic Racks – Cryogenic is the science of freezing, especially with reference to methods for producing very low temperatures so materials remain geneticaly stable and metabollically inert. Cryogenic racks from MBP are manufactured to withstand these freezing temperatures.

Cuvettes – Small plastic and metal sample containers used with electroporation instruments to introduce DNA into bacterial, yeast, and mammalian cells through the pulse of a very high voltage. MBP's Electroporation Cuvettes are ideal for high transfer efficiency.

DNA – Deoxyribonucleic acid. This is a molecule found in the nucleus of cells that encodes genetic information. The particular sequence of 4 chemical building blocks (nucleotides) determines a living organism's unique genetic code. All of MBP's tips and tubes are optimized to work effectively with DNA samples and amplification.

DNA AWAY – A laboratory cleaning solution sold by MBP that removes DNA from laboratory space and laboratory tools, which in turn decreases contamination of experiments. Combined with the patented ART barrier tips, contamination becomes a thing of the past for any laboratory.

DNase – (deoxyribonuclease) Any of numerous enzymes that catalyze the breakdown of DNA into oligonucleotides or mononucleotides.

Dome Cap – A dome-shaped lid on a PCR tube that prevents condensation when used with a heated thermocycler lid during the PCR process. MBP offers both dome and flat caps on PCR tubes.

EasyStart – A product sold by MBP that makes possible a one-step PCR assay. Simply add reaction-specific reagents above the wax layer to begin PCR.

Econopak – A packaging configuration sold as an option for MBP's non-sterile BioRobotix brand tips. This unit packaging consists of 96 tips/tray and 50 trays per pack.

Electroporation – Process that introduces DNA into bacterial, yeast and mammalian cells in a sample by the pulse of a very high voltage through a plastic and metal container (a cuvette) holding the DNA. MBP's electroporation cuvettes are ideal for high transfer efficiency.

Ergo – Short for Ergonomic. An ergonomic solution, product, or posture is one that reduces the potential for harm to a user when performing a certain task. This refers to MBP's three lines of ergonomic pipet tips that require less force to seat tips on and eject tips from a pipettor, thus causing less trauma to the muscles and bones of the hand and arm.

Ergo F – Refers to MBP's line of ergonomic pipet tips that work with Thermo LabSystem's brand of FinnPipet pipettors. They are available with the patented ART barrier or without filters in the Hydrologix brand in multiple size configurations. MBP is the only manufacturer to offer ergonomic tips for this line of pipettors.

Ergo G – Refers to MBP's line of ergonomic pipet tips that work with Gilson's brand of Pipetman pipettors. They are available with the patented ART barrier, or without filters, in the Hydrologix brand in multiple size configurations. MBP is the only manufacturer to offer ergonomic tips for this line of pipettors.

Ergonomic – An ergonomic solution, product, or posture is one that reduces the potential for harm to a user when performing a certain task. Thus, this refers to MBP's three lines of ergonomic pipet tips that require less force to seat tips on and eject tips from a pipettor, thus causing less trauma to the muscles and bones of the hand and arm. They are available with the patented ART barrier or without filters in the Hydrologix brand in multiple size configurations.

Extended Length – Refers to a pipet tip that is longer in length than the standard tip of the same microliter capacity. Extended length tips offer additional protection against cross contamination as these tips do not allow the shaft of a pipettor to enter the sample tube vessel and become contaminated. MBP offers the largest variety of extended length tips in our REACH Family of tips. These are offered with and without filters in our ART and HydroLogix brand lines.

Field Strength – Is the voltage strength used to introduce DNA into bacterial, yeast and mammalian cells through a process called electroporation. Different field strengths are necessary for different kinds of cells. Electroporation is done inside small plastic and metal sample containers called electroporation cuvettes. MBP's Electroporation Cuvettes are ideal for high transfer efficiency.

Filter – An absorbent section of material, usually made with high density polyethylene or cellular based material, that is inserted into a pipet tip to prevent the sample from reaching the pipettor. However, the patented ART barrier self-sealing filter is the only filter on the market that actually prevents aspirates and liquids from reaching the pipettor.

Filter Tip – A pipet tip with a filter inserted into it. A filter is usually an absorbent section of material made with high density polyethylene or cellular based material to prevent the sample from reaching the pipettor. However, the patented ART barrier self-sealing filter is the only filter on the market that actually prevents aspirates and liquids from reaching the pipettor.

Flat PCR Cap – A flat lid on PCR tubes that allows ease-of-use when opening and closing the tube as well as easy identification as the flat cap provides a writing surface. MBP offers both dome and flat cap PCR tubes.

Flipper racks – A bench top storage system that combines several racks into one for use with different size centrifuge tubes or microcentrifuge tubes. This saves precious work space while providing ease-of-use. MBP provides the choice of many different Flipper racks.

Flipstrip racks – Designed to hold PCR strip tubes as well as reagent vessels, this rack is ideal for PCR work. MBP offers these racks in a variety of colors for coordination of experiments.

FreeStanding Tubes – Microcentrifuge tubes with a flat bottom, additionally, have ribs on the tube and lid allowing for single-handed opening and closing.

Freezer racks – Researchers often freeze samples at extremely low temperatures in order to have the sample molecules stop moving – this is also referred to as Cryogenic freezing. Freezer racks from MBP are manufactured to withstand the most severe freezing temperatures.

Gel Loading – Refers to dispensing samples into acrylamide or agarose gels with pipet tips. MBP is one of two companies in the world to offer both filtered and unfiltered versions of ultraround gel tips for agarose, and ultraflat tips for polyacrimide gels.

Genomic Tips – Wide-bore tips that have an orifice that is usually 260% larger than the standard pipet tip orifice. Genomic tips are perfect for aspirating and dispensing genomic DNA, blood, and other viscous samples. In this catalog, genomic tips are identified with the letter G at the end of the catalog number.

Graduated – Tips or tubes that are marked with ease-of-use reference marks in order to verify how much sample has been retained. MBP offers a variety of ART and HydroLogix tips and tubes with graduations.

High Throughput Screening – The use of automated instruments to conduct the screening of samples such as compounds. These instruments are available from a variety of manufacturers and can utilize fixed stainless steel or disposable tips. MBP has the largest high quality line of tips for automated workstations in our BioRobotix brand line.

HLT – Short for HydroLogix Tips. This is the newly created line of unfiltered tips and tubes that is the most extensive line in the world. The HLT line includes beveled, micro point, ergonomic, low retention, gel loading and genomic tips (wide-bore), just to name a few - there is truly a tip to satisfy every researcher's needs.

HotStart – This MBP product provides everything needed to perform a complete PCR amplification in one single tube. It eliminates the need for mineral oil and allows for storage of pre-aliquoted master mixes for PCR and sequencing. Perform HotStart PCR with speed and simplicity – only from Molecular BioProducts.

HTS – Short for High Throughput Screening. The use of automated instruments to conduct the screening of samples such as compounds. These instruments are available from a variety of manufacturers and can utilize fixed stainless steel or disposable tips. MBP has the largest high quality line of tips for automated workstations in our BioRobotix branded line.

Hydrologix – This is the newly created line of unfiltered tips and tubes that is the most extensive line in the world. The HLT line includes beveled, MicroPoint, ergonomic, low retention, gel loading and genomic tips (wide-bore), just to name a few - there is truly a tip to satisfy every researcher's needs.

Hydrophilic – This means a surface that attracts liquids. When pipetting viscous samples and expensive reagents with pipet tips, this is not conducive to getting the most sample from your tips. Instead, it is preferable to have hydrophobic tips, such as the Low Retention line from MBP.

Hydrophobic – This means a surface that repels liquids. This is the ideal when pipetting viscous samples and expensive reagents as much less sample is left within the tip. Molecular BioProducts new Low Retention technology provides a hydrophobic surface that repels liquids. Available in the ART, HydroLogix and BioRobotix line in a variety

of sizes and packaging configurations, MBP's Low Retention are the perfect answer.

Individually Wrapped – One of the multiple packaging configurations available for our patented ART tips, this provides an additional level of security when sterilization is an absolute must. Every individually wrapped ART tip is 100% guaranteed sterile.

Liquid-Handling – In science, this refers to the movement of liquids by aspirating and dispensing. This can be accomplished by handheld pipettors or liquid-handling automated instruments. Only MBP offers pipet tips to fit all types of liquid handlers.

Liquid-Sensing Tips – The very first automated instruments on the market operated through liquid displacement technology – about half of the instruments still operate this way today. This technology allows tips manufactured with carbon, called liquid-sensing or conductive tips, to send an electronic signal through the tip back to the workstation when the tips come into contact with liquid to begin aspirating or dispensing automatically. This eliminates the need for pre-set heights to aspirate and dispense. Molecular BioProducts has extensive expertise and experience in molding liquid sensing tips – they are available for use on many different workstations in a variety of sizes and packaging options.

Low Retention – Molecular BioProduct's new Low Retention technology provides a hydrophobic surface that repels liquids. Available in the ART, HydroLogix and the BioRobotix line in a variety of sizes and packaging configurations. MBP's Low Retention are the perfect answer when pipetting viscous samples and expensive reagents, as much less sample is left within the tip.

LTS – Short for the Rainin Lite Touch System pipettors. These pipettors were designed to be ergonomically-friendly and provide less repetitive stress on joints and muscles. MBP offers a full line of tips to fit the Rainin Lite Touch pipettors – this is the only LTS line that is available with the patented ART filter.

MBP – Short for Molecular BioProducts, the only company that can offer the largest range of pipet tips on the market today for your hand-held pipettors or automated workstations. It is the only line available with the patented ART filter.

MicroPoint – A MicroPoint designed tip refers to a tip profile that is 50% smaller than standard blunt-end pipet tips and is significantly narrower than beveled-end tips. This increases precision, especially when working with low-volume samples. This offers less surface area with less sample retained, as well as more precision when pipetting.

Microcentrifuge Tubes – Tubes used during centrifugation that hold no more than 2 ml. Available with either the exclusive Safelock cap or screw-caps with O-rings, as well as graduated, conical, or freestanding shapes, MBP's microcentrifuge tubes are the tubes of choice.

Microtube racks – Racks that can hold PCR tubes as well as microcentifuge tubes – perfect for researchers performing PCR. MBP's microtube racks are reversible to maximize precious bench space and feature alphaneumeric grids for easy sample identification.

Microtubes – PCR tubes or microcentrifuge tubes, often used during PCR amplifications which hold up to 2ml. Molecular BioProducts offers a broad line of tubes in several different colors and styles for every application.

Non-sterile – Product that has not been sterilized. However, all of MBP's non-sterile products are certified to be RNase, DNase, Pyrogen, and ATP free as certified by a third-party laboratory.

Out-of-round – Outside of dimesional specifications.

OEM – Short for Original Equipment Manufacturer. In this context, OEM refers to the original companies that manufacture automated workstation equipment and the consumables that are used in conjunction with the workstations. Notably, MBP manufactures pipet tips and other consumables for several different OEM's that sell these items as their own lines.

Nose cone – Nozzle of automated workstation.

PCR – Stands for Polymerase Chain Reaction, a method used to make multiple copies of DNA. This is one of five amplification methods that currently exist, but is certainly the most widely used in laboratories. Make the most of your amplification with MBP's patented ART barrier that protects against cross contamination during amplification.

Pipet Tips – A disposable product that fits on hand-held pipettors and automatic workstation, usually made of polypropylene. It is also spelled as pipette tips. MBP has the broadest line of pipet tips in the world, offering a tip that suits every laboratory need.

Pipettor – A hand-held instrument used to aspirate and dispense small amounts of liquids in laboratories world-wide. Many different companies offer a wide range of pipettors for sale – only Molecular BioProducts has a tip for every different kind of pipettor made.

Plug Closures – Used to seal samples within culture tubes. MBP's plug closures feature a snug-fitting inexpensive cap for 12mm culture tubes.

Polyethylene – A translucent, lightweight thermoplastic made from ethylene. In this context, it is used in the manufacture of MBP's patented ART filter in combination with carboxymethylcellulose.

Polypropylene – A satiny thermoplastic similar to polyethylene, except that it has a higher melting point, is more resistant to chemicals, and is slightly stiffer. All of Molecular BioProducts clear tips are made from 100% virgin polypropylene for the clearest tips available on the market today.

Polystyrene – A clear, hard thermoplastic with a crystal-clear finish and a lower melting point than polypropylene. MBP uses this plastic in the manufacturing of snap plates for a durable surface for loading pipet tips evenly, especially for multi-channel pipettors.

Precision – A statistical measurement of repeatability that is usually expressed as a variance or relative standard deviation. In terms of pipet tips used on automated workstations, precision is measured by %CV (percentage coefficient of variation). All MBP BioRobotix tips are measured for %CV's, during manufacture and then again before final lot release. Product that is 2.5% CV or higher is not released for sale.

Pre-sterilized – In terms of pipet tips and tubes, this refers to product that has been sterilized prior to sale by electronic beam or gamma radiation in order to eliminate pathological microorganisms. Since gamma radiation may make tips and tubes brittle, MBP uses electronic beam sterilization to sterilize all tips and tubes sold as pre-sterilized. The term pre-sterilized is used instead of sterile as it is a more accurate description – product that has been opened during use cannot remain sterile.

PURE – Molecular BioProduct's terminology for tips and tubes that are RNase, DNase, Pyrogen, and ATP free. All of Molecular BioProduct's PURE tips and tubes are guaranteed by a third-party laboratory to be free of these contaminants.

PurePak – MBP's proprietary packaging for PCR tubes that are packaged in 10 individually sealed bags of 100 tubes in order to help guard against cross-contamination. These Quality Guarantee packs are puncture-proof and provide a Ziplock closure for easy resealing – only MBP offers PCR tubes in this quality packaging.

Purity – Being undiluted or unmixed with extraneous material. In terms of pipet tips and tubes, purity is a methodology in our manufacturing process. We impliment safeguards and handling requirements on our production floor, and on our assembly lines. To guarantee this we have an independent testing lab certify every sterilized lot of product to be RNA, DNA, RNase, DNase, Pyrogen, and ATP free.

Pyrogen – Clinically defined as any substance that can cause a rise in body temperature, pyrogens can also interfere with PCR amplification, or other important protein or enzyme work. All Molecular BioProduct's tips and tubes are guaranteed to be pyrogen free by an independent testing laboratory.

QC – Quality Control

Racked – A term used by MBP to specify tips that are sold in a racked format instead of by bulk bag. All of our tips are offered in racked, racked sterile, and bulk formats.

Rainin LTS – Refers to a specific brand of Lite Touch ergonomic pipettors sold by Rainin. These pipettors were designed to be ergonomically-friendly and provide less repetitive stress on joints and muscles. MBP offers a full line of tips to fit the Rainin Lite Touch pipettors – this is the only LTS line that is available with the patented ART filter.

REACH – Refers to MBP's REACH Family of tips, the largest variety of extended length tips on the market. REACH tips are pipet tips that are extended in length - longer than the standard tip of the same microliter quantity. Extended length tips offer additional protection against cross-contamination as these tips do not allow the shaft of a pipettor to enter the sample tube vessel and become contaminated. MBP's REACH family of tips are offered with and without filters in our ART and HydroLogix brand lines.

RNA – Ribonucleic acid, the nucleic acid involved in transcribing the genetic information stored in DNA, then translating this information into the sequence of amino acids in protein. All of MBP's tips and tubes are optimized to work effectively with RNA samples and RT PCR amplification.

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RNase – (ribonuclease) An enzyme that catalyzes the hydrolysis of ribonucleic acid RNA that can interfere with experiments when present RT-PCR especially, PCR. All of MBP's tips and tubes are guranteed to be RNase-free.

RNase AWAY – A laboratory cleaning solution sold by MBP that removes RNase and DNA from laboratory space and laboratory tools which in turn decreases contamination of experiments. Combined with the patented ART barrier tips, contamination becomes a thing of the past for any laboratory.

RT PCR – Abbreviation for reverse transcriptase polymerase chain reaction. A technique commonly employed in molecular genetics to reverse transcribe an RNA sequence synthesizing its complementary DNA (cDNA).

Safelock Cap – MBP's microcentrifuge tubes that feature an advanced locking system for safe and convenient centrifuging, boiling, freezing, incubation, or storage of samples for your most critical procedures. The Safelock cap snaps closed, then with the lock one simple hand operation easily slips into place. Available in 0.6, 1.5, or 2.0 ml sizes, these microcentifuge tubes will become your tubes of choice.

Seal Force – This refers to the amount of force necessary to create a secure seal between a pipetting channel and a plastic pipet tip; it can refer to the channels on a hand-held pipettor or an automated workstation. A good seal force will optimize pipetting but not make it difficult to eject the tips. Seal forces vary depending on the way the pipetting channel is manufacturered as well as the way the pipet tip is manufactured. MBP tests all pipet tips before market launch and tests every BioRobotix lot of pipet tips before release for sale to ensure the best seal force possible.

Self-sealing Barrier – Refers to the unique, patented self-sealing filter only available in ART tips that prevents aerosols and liquids from contaminating pipettors as well as preventing carryover contamination in samples. Only Molecular BioProducts offers this unique technology.

Semi-skirted – A PCR plate in which the plastic holding the wells together on the edges extends only half way down in order to accommodate fitting onto common amplification machines like Perkin-Elmer. MBP offers both full-skirted and semi-skirted PCR plates.

Skirted – A PCR plate in which the plastic holding the wells together on the edges extends down fully so that they may be used with robotic automated workstation equipment. MBP offers both semi-skirted and full-skirted PCR plates.

SoftFit – Only offered by Molecular BioProducts, many of our tips are designed with a unique thin-wall design that ensures a reliable fit across all channels on a multi-channel pipettor or automated workstation in order to provide unsurpassed tip-to-tip precision. SoftFit tips are available with or without our patented ART filter for a variety of hand-held and automated pipettors.

SoftFit~L – Refers to MBP's pipet tips made especially for the ergonomic Rainin LTS pipettors that are cylindrical rather than conical to produce a reliable, consistent seal without using excessive force. These tips are also thin-walled and incorporate a small, well-defined seal area with a positive stop which leads to reduced ejection force when compared to traditional tips and pipettors. Available in a variety of sizes, with or without the patented ART barrier, these tips offer you what no other company can.

Solvent Safe – Refers to MBP's line of special carbon filtered pipet tips for use in combinational chemistry when pipetting acids, bases, and aggressive organic solvents. Our revolutionary use of the ART filter with Folded Activated Carbon offers protection for your pipettor and sample against the destructive carryover of aerosols and vapors from volatile organic solvents without compromising pipetting accuracy and precision.

Standard-wall Tip – A pipet tip that has thick walls in order to ensure proper fit to the channel of the pipettor - hand-held or robotic. This requires a certain amount of force to load and eject from the pipettor. Conversely, MBP offers many thin-wall pipet tips that require less force to load and eject. This resultis in less wear-and-tear on automated workstations or the hands and arms of a user operating a hand-held pipettor. Only MBP can offer you this unique design.

Sterility – In terms of pipet tips and tubes, this refers to product that has been sterilized prior to sale by electronic beam or gamma radiation in order to eliminate pathological microorganisms. Since gamma radiation may make tips and tubes brittle, MBP uses electronic beam sterilization to sterilize all tips and tubes sold as pre-sterilized. The term pre-sterilized is used instead of sterile as it is a more accurate description – product that has been opened during use cannot remain sterile.

Thin-wall – Only offered by Molecular BioProducts, many of our tips are designed with a unique thin-wall design that ensures a reliable fit across all channels on a multi-channel pipettor or automated workstation in order to provide unsurpassed tip-to-tip precision. MBP calls these tips SoftFit: they are available with or without our patented ART filter for a variety of hand-held pipettors and automated workstations.

Tips – Short for Pipet Tips, this refers to a consumable, usually made of polypropylene, that fit on hand-held pipettors, and automatic workstation. It is also spelled as pipette tips. MBP has the broadest line of pipet tips in the world, offering a tip that suits every laboratory need.

TIR – An abbreviation for Total Indicator Runout, this is a measure of tip straightness often tested for, especially with automated workstation tips. TIR is just one of the 15 different QC tests Molecular BioProducts carries out on our BioRobotix brand of pipet tips for automated workstations.

Virgin Polypropylene – This is the pure form of polypropylene, meaning it has not been molded previously - it is newly synthesized, pure polymer for plastics manufacture. Polypropylene is a satiny thermoplastic similar to polyethylene except that it has a higher melting point, is more resistant to chemicals, and is slightly stiffer. All of Molecular BioProducts clear tips are made from 100% virgin polypropylene for the clearest tips available on the market today.

Wide-bore – Refers to tips that have a tip orifice usually 260% larger than the standard tip orifice – MBP refers to these tips as genomic. Genomic tips are perfect for aspirating and dispensing genomic DNA, blood, and other viscous samples. Here, in this catalog, genomic tips are identified with the letter G at the end of the catalog number.

Workstation – Automatic robotic machines with disposable or fixed tips that aspirate and dispense liquids. Current workstations function by either air displacement or liquid displacement technology and can have anywhere from 1 to 384 channels on their head. MBP offers the broadest range of tips for automated workstations on the market, with tips to fit every major manufacturer.

XLG – Abbreviation for the extended length genomic tip within the patented ART and Hydrologix line of pipet tips. It is a 200µl tip that is available in racked or bulk format.

XLP – Short for extended length tip for the Gilson Pipetman. Available in 100ul or 200ul sizes with, or without, the patented ART filter, this is part of the REACH family of tips perfect for further protecting your pipettor against cross-contamination.

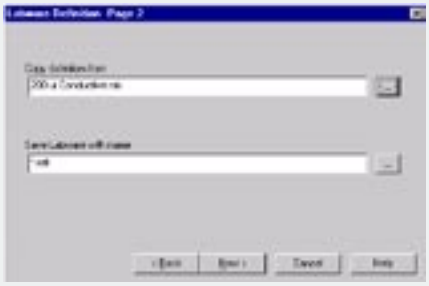
Appendix A: Automated Instrumentation Section

A.1: BioRobotix troubleshooting Creating a 50µl Conductive tip for Perkin-Elmer MultiPROBE II HT

- **Click on Utilities > Labware Library…**
- **Under Categories – select Disposable Tips.**
  This will show a list of available tips that are built in the system.
- **Click New**
  This alerts the pop-up "Do you want to copy the definition from an existing definition?". You want to do this so click Yes > and then the Next button.
- **A box should appear like the one in Fig. 1**
  You want to copy a definition so click on the … button and highlight the "200µl Conductive.rak" definition and Open. Now your screen should look exactly like the picture in Fig. 1.
  Now you want to save the labware with the name you will call it, such as "50µl Conductive.rak".

To finish, click Next and then Finish.
It should automatically open Labware Library, Click OK.

Fig. 1

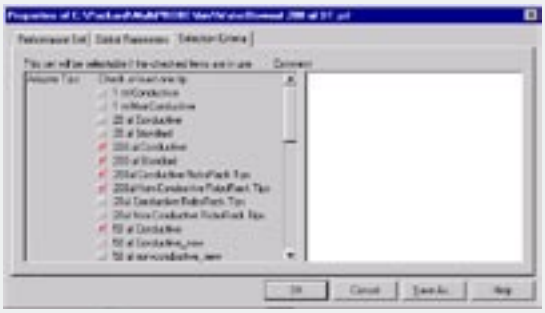


- **Click on Utilities > Performance Set Library.**
- **Now click on 200µl Conductive and then the performance file that you would run with this tip.**
- **Three tabs should appear: Performance Set, Global Parameters, and Selection Criteria.**

Click on Selection Criteria.
Now select the new labware that has just been created (50µl Conductive).
The box should then become checked (See Fig. 2).
To finish, click OK, and then OK.

- **Now you can create your Method.**
- **When you are finished with the Layout, double click on the rack with the created tips and under Edit, define the new positions (the default should be fine, but you still want to verify).**

Fig. 2



A.2: MBP Beckman Biomek FX 10µl Tip Set-up

Creating the Rack:
Under Tools > Labware Type Editor
- Click New
- Under the Type scroll down box, select: TipBox
- In the text window type: MBP_BiomekFX_10µl

Characteristics of the Rack:
Double Click the rack that has been created (MBP_BiomekFX_10µl) in the labware to open its characteristics. The default will work fine for this rack.
- Under the basic information tab, you have the option to change the color of the rack to violet.
- The default tip with this rack will become MBP_BiomekFX_10µl. If you want a different name, you need to create the tip under a new name, and then re-open this Labware and change the default tip to the changed tip.
- Under the ordering information tab, for manufacturer type: Molecular BioProducts and the part number is: 912-262 for non-sterile, 912-261 for sterile, or 912-021 for the sterile ART version.
- Click Exit when finished.

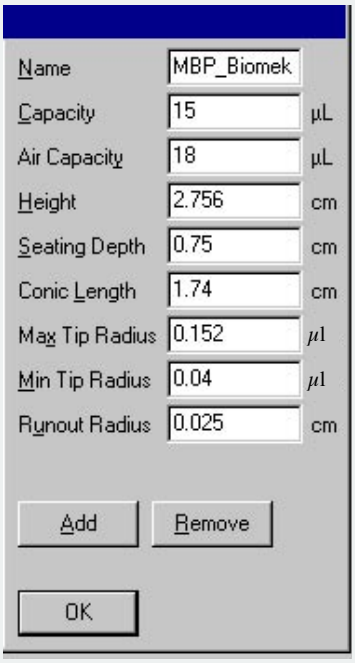
Creating the Tip:

Under **Tools** > **Tip Type Editor**
Name: The default from creating the rack will be ***MBP_BiomekFX_10ul***.
With the scroll down, select ***MBP_BiomekFX_10ul***.

Enter the Following Information (see Fig. 1):
Capacity: 15ul
Air Capacity: 18ul
Height: 2.756cm
Seating Depth: 0.75cm
Conic Length: 1.74cm
Max Tip Radius: 0.152cm
Min Tip Radius: 0.04cm
Runout Radius: 0.025cm

Note: When you create your method for your instrument setup, double click on the rack and fill in its properties. Make sure "load no more than _ times," has an appropriate value for your method. This number should be the maximum number of allowable transfers the tips can be used before they are cleaned or changed. Continue creating your method.

Fig. 1



A.3: MBP Beckman Biomek FX 20µl Tip Set-up

Creating the Rack:

Under **Tools** > **Labware Type Editor**

- Click ***New***
- Under the Type scroll down box, select: ***TipBox***
- In the text window type: ***MBP_BiomekFX_20µl***

Characteristics of the Rack:

Double Click the rack that has been created (***MBP_BiomekFX_20µl***) in the labware to open its characteristics. The default will work fine for this rack.

- Under the ***basic information*** tab, you have the option to change the color of the rack.
- The default tip with this rack will become ***MBP_BiomekFX_20µl***.
  If you want a different name, you need to create the tip under a new name, and then re-open this Labware and change the default tip to the changed tip.
- Under the ***ordering information*** tab, for manufacturer type: ***Molecular BioProducts*** and the part number is: ***918-262 for non-sterile, 918-261 for sterile, or 918-021 for the sterile ART version***.
- Click ***Exit*** when finished.

Creating the Tip:

Under **Tools** > **Tip Type Editor**

Name: the default from creating the rack will be ***MBP_BiomekFX_20µl***.
With the scroll down, select ***MBP_BiomekFX_20µl***.

Enter the Following Information:

Capacity: 100µl
Air Capacity: 120µl
Height: 3.825cm
Seating Depth: 0.75cm
Conic Length: 2.047cm
Max Tip Radius: 0.152cm
Min Tip Radius: 0.04cm
Runout Radius: 0.025cm

Note: When you create your method for your instrument setup, double click on the rack and fill in its properties. Make sure "load no more than _ times," has an appropriate value for your method. This number should be the maximum number of allowable transfers the tips can be used before they are cleaned or changed.

Continue creating your method.

A.4: MBP Beckman Biomek FX 200ul Tip Set-up

Creating the Rack:

Under Tools > Labware Type Editor

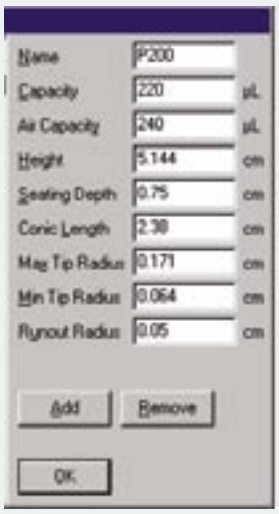
- Click New
- Under the Type scroll down box, select: TipBox
- In the text window type: MBP_BiomekFX_200ul

Characteristics of the Rack:

Double click the rack that has been created (MBP_BiomekFX_200ul) in the labware to open its characteristics. The default will work fine for this rack.

- Under the basic information tab, you have the option to change the color of the rack.
- The default tip with this rack will become MBP_BiomekFX_200ul.
If you want a different name, you need to create the tip under a new name, and then re-open this Labware and change the default tip to the changed tip.
- Under the ordering information tab, for manufacturer type: Molecular BioProducts and the part number is: 919-262 for non-sterile, 919-261 for sterile, or 919-021 for the sterile ART version.
- Click Exit when finished.

Fig. 1



Creating the Tip:

Under Tools > Tip Type Editor
Name: the default from creating the rack will be MBP_BiomekFX_200ul.
With the scroll down, select MBP_BiomekFX_200ul.

Enter the Following Information (see Fig. 1):
Capacity: 220ul
Air Capacity: 240ul
Height: 5.144cm
Seating Depth: 0.75cm
Conic Length: 2.38cm
Max Tip Radius: 0.171cm
Min Tip Radius: 0.064cm
Runout Radius: 0.05cm

Fig. 1

Note: When you create your method for your instrument setup, double click on the rack and fill in its properties. Make sure "load no more than _ times," has an appropriate value for your method. This number should be the maximum number of allowable transfers the tips can be used before they are cleaned or changed.

Continue creating your method.

A.5: Suggestions for Deck Positioning on Beckman Biomek FX Instruments

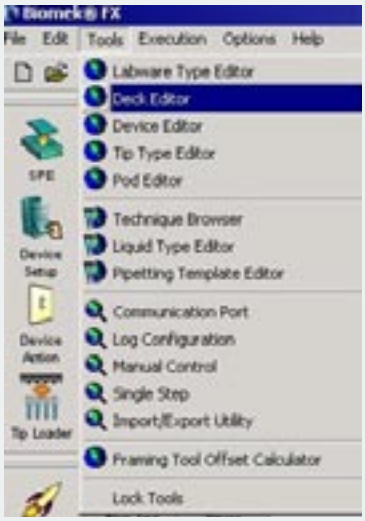
Occasionally, the Biomek FX Deck will need modification. A great feature of the Biomek FX is that it can automatically calibrate itself with the "AutoTeach" function. It is recommended that you routinely perform the auto-calibration step. Over time, it will begin to lose alignment.

Sometimes, the "Framing Tool Offset" will go out of alignment. This is a problem because when you AutoTeach the deck, it actually takes account for the "Framing Tool Offset" and the deck position in the software isn't completely based upon the actual deck position. Therefore, if you are trying to use a 384 plate washer, a 1536 plate, or another high precision ALP, you might need to slightly modify the deck manually. This option is simple to perform and there is no need to schedule a service call. If all of the positions on the deck are misaligned then it might be better to have a Service Engineer come and re-calibrate the Framing Tool Offset.

See Fig. 1 for instructions on how to manually "move" the deck within the software.

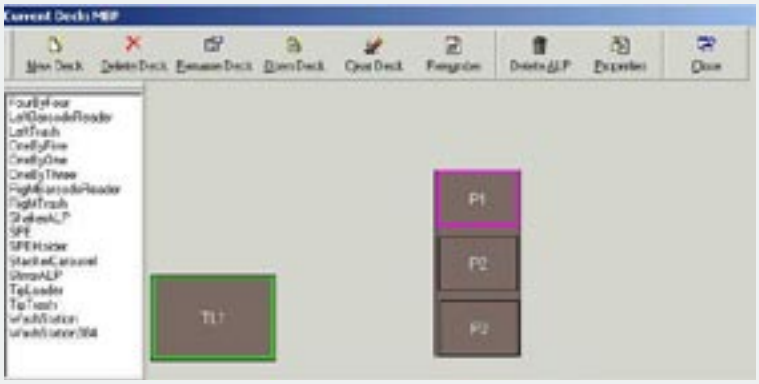
1. Open the Saigen Biomek FX Software and under the 'Tools' menu, click on "Deck Editor."

Fig. 1



2. Your current deck should appear. You should be able to see all ALPs associated with the current deck. When you click on a position, it will highlight. If you double click the position, the properties screen will appear for that position. Double click on the position you want to manually modify (Four positions shown. Fig 2).

Fig. 2



3. This is an example of Position P2 on the One By Three ALP shown above. Next to "Pod1 Coordinates," you will see the X, Y, and Z value positions in centimeters. This tells the software where P2 is in reference to HOME position. When you calibrate this position through AutoTeach, it will update these coordinates automatically within the software. The next step, Fig 3, is to manually type a value into the X, Y, and/or Z box.

Fig. 3

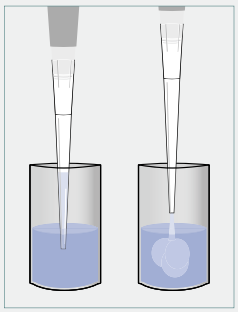
4. The final step is to highlight the corresponding box(es) that you want to modify and type in the value. For example, if you notice that the tips are always slightly left of where they should be and sometimes they hit the left edge of your labware, you should change the X coordinate to account for the misalignment. In this case you want to increase the X value. The position in the software will shift slightly to the right so the next time you run your method, the head will think that the position is slightly to the right but really it will be in the center, where it should be. The value you change will depend on the alignment. Since the coordinate values are in centimeters, it should be relatively simple to determine the correct value. If you don't know the correct value, it is a good practice to be conservative by adjusting the value by 0.05cm (0.5mm) at a time. If necessary, repeat this step until your deck is modified properly.

Fig. 4

Appendix B:10 Tips to improve your pipetting technique

1. Pre-wet the Pipet Tip

Aspirate and dispense an amount of the sample liquid at least three times before aspirating a sample for delivery.



Evaporation within the tip can cause a significant loss of sample before delivery. Pre-wetting increases the humidity within the tip thus reducing both the amount of, and variation in, sample evaporation. Using the same tip (without pre-wetting) to deliver multiple samples results in lower volume for the first few samples.

2. Work at Temperature Equilibrium

Allow liquids and equipment to equilibrate to ambient temperature.

The volume of sample delivered by air displacement pipets varies with air pressure, relative humidity, and vapor pressure of the liquid, all of which are temperature dependent. Working at a single, constant temperature minimizes the variation.

3. Examine the Tip Before Dispensing Sample

Wipe the tip only if there is liquid on the outside of the tip, and then, very carefully.

Absorbent material will rapidly absorb sample from the tip if it contacts the tip opening. Unnecessary tip wiping increases the possibility of sample loss.

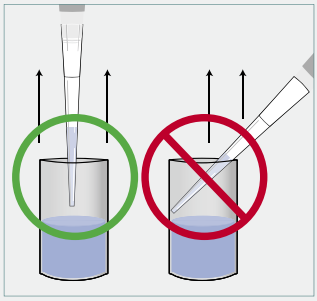
4. Use Standard Mode Pipetting

Choose standard mode pipetting rather than "reverse mode", for all but viscous samples, if accurate and precise results are desired.

In reverse mode pipetting, the plunger is depressed completely (past the first stop) to aspirate the sample, and then depressed only to the first stop to deliver the sample.

5. Pull the Pipet straight Out

Pull the pipet straight out of the container after aspirating a sample. Do not touch the tip to the sides of the container.



This technique is especially important when pipetting small volumes (<5µl). Surface tension effects cause the sample volumes to vary if the exit angle varies. Touching the tip against the sides results in loss of sample.

6. Pause Consistently after Aspiration

Pause with the tip in the liquid for one or two seconds after aspirating the sample.

The amount of liquid in the tip "bounces" slightly when the plunger stops. Slow, even plunger release and a consistent, brief pause after aspiration minimize errors resulting from this phenomenon.

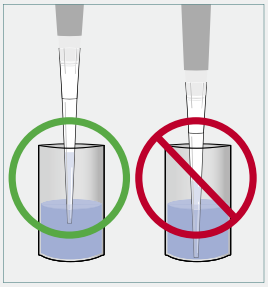
7. Minimize Handling of the Pipet and Tip

Set the pipet down between sample deliveries and avoid handling the tip.

Body heat transferred to equipment during handling disrupts temperature equilibrium. As explained in Tip #2, the volume of sample delivered varies with temperature.

8. Immerse the Tip to the Proper Depth

Immerse the tip two to five millimeters below the meniscus and well clear of the container walls and bottom during sample aspiration.



Inserting the tip too far into the liquid causes excess droplets of liquid to cling to the outside of the tip. Pressing or resting the tip against the container walls or bottom restricts entry of the sample.

9. Use the Correct Pipet Tip

Securely attach a tip designed for use with the pipet.

Mismatching a tip and pipet or using poor quality tips can result in an inadequate seal between the pipet and the tip. Quality tips are flexible and have thin walls, providing an airtight seal and more dependable delivery of the sample.

10. Use Consistent Plunger Pressure and Speed

Depress and release the plunger smoothly and with consistent pressure and speed for each sample.

Pipets, like all precision instruments, give more reproducible results when operated with attention to detail and with proper technique.

References: Lochner KH, Ballweg T, Fahrenkrog H-H. "Factors influencing the measuring accuracy of piston Pipets with air interface." (German). J Lab Med 1996; 29 (7/8): 430-40.
Ylatupa S. "Choosing a pipets Technique Affects the Results of Your Analysis." European Clinical Laboratory 1996. 10:14

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APENDIX C: %CV AND SAMPLE DELIVERY ACCURACY

%CV, provides a statistical measure of relative variability regarding the ability of a pipet tip and associated aspiration and its dispensing tool (hand-held pipettor or robotic instrument) Therefore, % CV is essential for evaluating the repeatability of a liquid handling system. However, the handling system needs not only to be repeatable, but accurate as well. If a researcher in a lab intends to draw and dispense 75 µl of sample and only dispenses 50 µl, but does so exactly every time, the measured %CV is zero, and therefore is considered excellent (perfect, actually). This is not the case though, as the *accuracy* of the liquid transfer is off by 33% - a number that is horrible, especially in applications where an exact amount of solution is required to foster a reaction or properly saturate a sample.

Obviously, this is an extreme example, but it does illustrate the shortcomings of using %CV alone as the barometer for liquid handling performance. Given this shortcoming, accuracy needs to be reported as well. This can be accomplished by simply dividing the amount of sample delivered by the amount that was expected - a result that is better, the higher the percentage. From a fundamental standpoint, this method of reporting accuracy leaves something to be desired.

First, %CV is reported such that a small number is good and a large number is bad, following the logic that the number represents the amount of error in the system. Using the simple method for calculating accuracy discussed previously, this logic is reversed, meaning that a larger number is better than a small one, or that the number represents how well the system is working. This is certainly not a catastrophic problem, but rather an annoyance when trying to review technical data.

Second, using the simple division method for calculating accuracy can result in numbers greater than 100%. Although this seems a bit odd (delivering more than was aspirated), it is possible and in fact happens with more frequency than most people realize. This further complicates evaluating the data as most people look at numbers greater than 100% as a good thing when in reality the same logic mentioned previously applies and one would end up with an inaccurate amount of liquid being delivered.

With all of this considered, an effort was made to develop a single number that reports not only the repeatability of a liquid handling system, but its accuracy as well. Because different researchers are concerned with each aspect of this number (repeatability and accuracy) in different ways, a calculator has been developed that will show not only the total combined performance but the individual repeatability (%CV) and accuracy results. It has been standardized based on the typical reporting of CV so that the smaller the number the better.

For those readers who are interested in the mathematics involved, here's how it all works. %CV is typically calculated by using the equation:

$$\%CV = \frac{\sigma}{\bar{X}}\ (100)$$

Where σ is the standard deviation of the data and $\bar{X}$ is the mean of the data. This formula tells you how tightly the samples were clustered around the mean. As was illustrated in the example, this isn't the whole story. Accuracy needs to be included as well, which is simply calculated by dividing the amount of sample delivered (S_d) by the amount expected (S_e):

$$Accuracy = \frac{S_d}{S_e}$$

In order to keep this reported in the same fashion as %CV (good numbers small, bad numbers big) and to make sure that the equation reflects that any difference between the expected sample delivered and the actual sample delivered is captured, the equation needs to be modified. By dividing the difference between the sample expected and the sample delivered by the sample expected and then taking the absolute value of that number:

$$Accuracy = \left|\frac{S_e - S_d}{S_e}\right|$$

a result is calculated that fits the standard reporting of CV and isn't impacted if the sample delivered is larger than the sample expected.

To combine these two numbers, the math gets a little bit trickier. Simply multiplying the CV number by the accuracy number will cause the overall number to be very small (1% of 1%, for example is 0.01%). While this works if the overall number is compared to other overall numbers, it is two orders of magnitude smaller than %CV reporting. Again, this isn't necessarily a bad thing, but it makes it a little harder to wrap one's mind around. So, by reversing the numbers such that they are expressed in a way that is opposite to the normal convention (make good numbers big as opposed to good numbers small), multiply the results together and then convert back:

$$\left\{1-\left[\left(1-\left|\frac{S_e - S_d}{S_e}\right|\right)\left(1-\frac{\sigma}{\bar{X}}\right)\right]\right\}$$

gives a number that is of the same order of magnitude as %CV. The whole thing is then multiplied by 100 to express the result in percentage.

As an example of how this works, MBP's Beckman 384 %CV that was measured at 2.09% using the conventional method yielded 3.51% using the overall formula. Beckman's tips, however, had a conventional %CV of 1.82% and yielded a 4.09% using the overall formula. What this illustrates is that the MBP product, overall, is significantly better than Beckman as the MBP product is both accurate and repeatable, while the Beckman product is repeatable, but less accurate.

Appendix D: Units, Metric Prefixes, conversion Factors, pH values, & Symbols

METRIC PREFIXES				
T	=	terra	=	10^{12}
G	=	giga	=	10^{9}
M	=	mega	=	10^{6}
k	=	kilo	=	10^{3}
c	=	centi	=	10^{-2}
m	=	milli	=	10^{-3}
µ	=	micro	=	10^{-6}
n	=	nano	=	10^{-9}
p	=	pico	=	10^{-12}
f	=	femto	=	10^{-15}
a	=	atto	=	10^{-18}
z	=	zepto	=	10^{-21}

VOLUME	WEIGHT
1 nl	1 µg
1 µl	1 mg
1 ml	1 g
1l	1,000 g (1 kg)

Units and Rates of Decay		
Conversion Factors:		
1 day	= 1.44 x 10^{3} min	= 8.64 x 10^{4} s
1 year	= 5.26 x 10^{5} min	= 3.16 x 10^{7} s

Foreign Units	
Legths:	
1 inch (in)	= 2.54 cm
1 foot (ft)	= 12 in = 30.48 cm
Volumes: GB	
1 pint (pt)	= 0.5679 liter
1 quart (qt)	= 2 pt = 1.1359 liter
1 gallon (gal)	= 4 qt = 4.5435 liter
Volumes: US	
1 pint (pt)	= 0.4729 liter
1 quart (qt)	= 2 pt = 0.9458 liter
1 gallon (gal)	= 4 qt = 3.7832 liter
Temperature:	
1 K+°C+273.15	

GREEK ALPHABET		
α	Α	Alpha
β	Β	Beta
γ	Γ	Gamma
δ	Δ	Delta
ε	Ε	Epsilon
ζ	Ζ	Zêta
η	Η	Êta
ϑ	Θ	Thêta
ι	Ι	Jiota
κ	Κ	Kappa
λ	Λ	Lambda
µ	Μ	Mu
ν	Ν	Nu
ξ	Ξ	Xi
ο	Ο	Omikron
π	Π	Pi
ρ	Ρ	Rho
σ	Σ	Sigma
τ	Τ	Tau
υ	Υ	Upsilon
φ	Φ	Phi
χ	Χ	Chi
ψ	Ψ	Psi
ω	Ω	Omega

Units and Rates of Decay		
Size	Old unit resp. commonly used unit	Actual unit
Pressure	1 at	0.980665 bar
	1 Atm (= 760 Torr)	1.01325 bar
	1 Torr	1.3332 mbar
	1 mWS	0.0980665 bar
	1 mmWS	0.0980665 mbar
Energy	1 mkp	9.80665 J
	1 kcal	4.1868 kJ
	1 erg	10^{-7} J
Radioactive decay	1 dpm	60 Bq
	1 Ci = 2.22 x 10^{12} dpm	3.7 x 10^{10} Bq
	1 mCi = 2.22 x 10^{9} dpm	3.7 x 10^{7} Bq
	1 µCi = 2.22 x 10^{6} dpm	3.7 x 10^{4} Bq

METRIC PREFIXES				
T	=	terra	=	10^{12}
G	=	giga	=	10^{9}
M	=	mega	=	10^{6}
k	=	kilo	=	10^{3}
c	=	centi	=	10^{-2}
m	=	milli	=	10^{-3}
µ	=	micro	=	10^{-6}
n	=	nano	=	10^{-9}
p	=	pico	=	10^{-12}
f	=	femto	=	10^{-15}
a	=	atto	=	10^{-18}
z	=	zepto	=	10^{-21}

Common abbreviations	
ds	double-stranded (as in dsDNA)
ss	single-stranded (as in ssDNA)
bp	base pair
kb	kilobase: 1,000 bases or base pairs, as appropriate
Mb	megabase: 1,000,000 bp
Da	dalton, the unit of molecular mass; kDan = 1,000 Da, MDa = 1,000,000 Da.
MW	molecular weight
M	molarity, moles of solute per liter of solution
mol	absolute amount of a substance
λ	wavelength
λ_{max}	wavelength at the absorption maximum

Tris-HCl Buffer, pH Values																
5°C	7.76	7.89	7.97	8.07	8.18	8.26	8.37	8.48	8.58	8.68	8.78	8.88	8.98	9.09	9.18	9.28
25°C	7.20	7.30	7.40	7.50	7.60	7.70	7.80	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70
37°C	6.91	7.02	7.12	7.22	7.30	7.40	7.52	7.62	7.71	7.80	7.91	8.01	8.10	8.22	8.31	8.42

Conversion of weight to absolute quantity (mol)		
1 µg of 1,000 bp DNA	= 1.52 pmol	= 9.1×10^{11} molecules
1 µg of pUC18/19 DNA (2,686 bp)	= 0.57 pmol	= 3.4×10^{11} molecules
1 µg of pBR 322 DNA (4,361 bp)	= 0.35 pmol	= 2.1×10^{11} molecules
1 µg of M13mp 18/19 DNA (7,250 bp)	= 0.21 pmol	= 1.3×10^{11} molecules
1 µg of λ-DNA (48,502 bp)	= 0.03 pmol	= 1.8×10^{10} molecules

Conversion of absolute quantity (mol) to weight	
1 pmol of 1,000 bp DNA	= 0.66 µg
1 pmol of pUC18/19 DNA (2,686 bp)	= 1.77 µg
1 pmol of pBR 322 DNA (4,361 bp)	= 2.88 µg
1 pmol of M13mp 18/19 DNA (7,250 bp)	= 4.78 µg
1 pmol of λ-DNA (48,502 bp)	= 32.01 µg

Appendix E: Chemicals (Acids & Bases) and Isotopes

Acids and Bases					
	Molecular weight	% by weight	Molarity (approx.)	1 M solution (mol/L)	Specific gravity
Acids					
Acetic acid (glacial)	60.05	99.6	17.4	57.5	1.05
Formic acid	46.02	90	23.6	42.4	1.205
		98	25.9	38.5	1.22
Hydrochloric acid	36.46	36	11.6	85.9	1.18
Nitric acid	63.02	70	15.7	63.7	1.42
Perchloric acid	100.46	60	9.2	108.8	1.54
		72	12.2	82.1	1.70
Phosphoric acid	80.00	85	14.7	67.8	1.70
Sulfuric acid	98.07	98	18.3	54.5	1.835
Bases					
Ammonium hydroxide	35.0	28	14.8	67.6	0.90
Potassium hydroxide	56.11	45	11.6	82.2	1.447
Sodium hydroxide	40.0	50	19.1	52.4	1.53

Isotopes - Physical properties of commonly used isotopes					
Nuclide	Half-life	Emission	Energy, max, (MeV)	Range of emission, max.	Rec. shielding (half-value layer)
^{3}H	12.43 years	β	0.0186	0.42 cm (air)	-
^{14}C	5,370 years	β	0.156	21.8 cm (air)	-
^{32}P	14.3 days	β	1.71	610 cm (air)	Acrylic glass (1 cm)
				0.8 cm (water)	-
				0.76 cm (acrylic glass)	-
^{33}P	25.4 days	β	0.249	49 cm	Acrylic glass (1 cm)
^{35}S	87.4 days	β	0.167	24.4 cm (air)	-
^{125}I	60 days	β	0.27-0.035	0.2 cm (air)	Lead (0.02 mm)

Appendix F: Troubleshooting and solutions to Pipetting Errors

Researchers can often experience considerable deviations from preferred pipetting volumes. These deviations can be caused by cross-contamination or liquid-handling errors, as well as peripheral factors. Molecular BioProducts prides itself on the patented ART tips that provide 100% guaranteed protection against cross-contamination, but if you find that you are still experiencing issues, below we have provided the causes and solutions to some commonly occurring pipetting errors.

Error	Cause	Solution
Pipet drips or leaks	Tip is loose; tip does not fit correctly	Use original tip; press on tightly
	Nose cone is scratched	Replace nose cone
	Seal of nose cone is leaking	Replace nose cone
	Piston is contaminated by reagent deposits	Clean and lubricate piston; replace seal
	Piston is damaged	Replace piston and piston seal
	Piston is seal damaged	Replace seal and lubricate piston
	Piston scrapes and is contaminated	Clean and lubricate piston
Dispensing button does not move smoothly	Seal is swollen by reagent vapors	Open Pipet and ventilate; lubricate piston if necessary
	Piston is visibly damaged or coated with insoluble deposit	Replace piston and piston seal
Inaccurate volume	Deviating pipetting conditions	See table below
	Pipet is leaking	Check for leaks then proceed as above
	Pipet is misadjusted	Recalibrate as described

Causes of inaccurate volume	Maximum error (inaccuracy)	Solution
Pipet is held at an angle	+ 0.5%	Hold Pipet straight
Pipet tip does not fit correctly	> 0.4%	Use original ART or Hydrologix tips
Density of medium (eg, r=1.1 g/cm^3)	- 0.4%	Adjust Pipet
Temperature differences (eg, Pipet 22^{o}C, sample 4^{o}C)	- 5.4%	Align Pipet and medium
Geographical location (eg, 1,000 m above sea level)	- 0.4%	Adjust Pipet

Appendix G: DNA & Nucleotide Molecular Weight Conversions

DNA content of various organisms	
Organism	**DNA content (in bp) (haploid Genome)**
Escherichia coli	4.2×10^6
Arabidopsis thaliana	4.7×10^6
Saccharomyces cerevisiae	1.4×10^7
Drosophila melanogaster	1.4×10^8
Man	3.3×10^9
Triticum aestivum (hexaploid wheat)	1.7×10^{10}

Molecular weight of DNA fregments	
500 bp dsDNA	= 325,000 dalton
500 nt (Nucleotide) ssDNA	= 162,500 dalton
1 kb dsDNA	= 660,000 dalton
1 kb ssDNA	= 330,000 dalton
1 kb ssRNA	= 340,000 dalton
1 MDa of dsDNA	= 1.52 kb
The average molecular weight of dNMP is 325 dalton.	
The average molecular weight of DNA base pair is 650 dalton.	

Compound	Molecular weight (in dalton)
ATP	507.2
CTP	483.2
GTP	523.2
UTP	484.2
dATP	491.2
dCTP	467.2
dGTP	507.2
dTTP	482.2
AMP	347.2
CMP	323.2
GMP	363.2
UMP	324.2
dAMP	312.2
dCMP	288.2
dGMP	328.2
dTMP	303.2

Appendix H: Protein Conversions

Conversion of proteins to DNA length	
Protein with a molecular weight of 10,000	= 270 bp DNA
Protein with a molecular weight of 30,000	= 810 bp DNA
Protein with a molecular weight of 37,000 (corresponds to 333 amino acids of coding capacity)	= 1,000 bp DNA
Protein with a molecular weight of 50,000	= 1.35 kb DNA
Protein with a molecular weight of 100,000	= 2.7 kb DNA

Conversion of absolute mass (mol) to weight µg	
100 pmol of 100,000 dalton protein	= 10 µg
100 pmol of 50,000 dalton protein	= 5 µg
100 pmol of 10,000 dalton protein	= 1 µg

Notes

Appendix I: ART Cross-Reference Pipettor Tip Fits Chart

ART CROSS REFERENCE	Gilson/Pipetman								RAININ															
	Pipetman P-2 2ul	Pipetman P-10 10ul	Pipetman P-20 20ul	Pipetman P-100 100ul	Pipetman P-200 200ul	Pipetman P-1000 1000ul	Pipetman P-5000 5ML	Pipetman P-10ML 10ML	EP-10/E2-MIC-10 10ul	EP-25/E2-25 25ul	EP-100/E2-100 100ul	EP-250/E2-100 250ul	EP-1000/E2-1000 1000ul	Pipet Lite LTS L-2 2ul	Pipet Lite LTS L-10 10ul	Pipet Lite LTS L-20 20ul	Pipet Lite LTS L-100 100ul	Pipet Lite LTS L-200 200ul	Pipet Lite LTS L-1000 1000ul	LTS 8 & 12 Multi-Channel L8-10 L12-10	LTS 8 & 12 Multi-Channel L8-20 L12-20	LTS 8 & 12 Multi-Channel L8-200 L12-200	LTS 8 & 12 Multi-Channel L8-300 L12-300
10ul																								
ART 10	•	•							•															
ART 10 REACH	•	•							•															
ART 10F				•	•																			
ART 20E																								
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ART 20P										•														
ART GEL 20P			•	•	•																			
ART 20L																•								
ART 20 ERGO-F																								
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ART 100 ERGO-G				•																				
ART 100 ERGO-F																								
ART GEL 100																								
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200ul to 500ul																								
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ART 200G																								
ART200L																	•	•						
ART 200 ERGO-G					•																			
ART 200 ERGO-F																								
ART XLP 200																								
ART XLG																								
ART 300																								
1ML to 5 ML																								
ART 1000																								
ART 1000E						•							•											
ART 1000 REACH						•																		
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ART1000L																			•					
ART 1000 ERGO-G						•																		
ART 1000 ERGO-F																								
ART 1200																								
ART 1250																								
ART 5000																								

RAININ														EPPENDORF													
LTS 8 & 12 Multi-Channel L8 & L12-1200	EDP3 Electronic E3-10	EDP3 Electronic E3-20	EDP3 Electronic E3-100	EDP3 Electronic E3-200	EDP3 Electronic E3-1000	EDP3 8&12 Multi-Channel E8-10 E12-10	EDP3 8&12 Multi-Channel E8-20 E12-20	EDP3 8&12 Multi-Channel E8-200 E12-200	EDP3 8&12 Multi-Channel E8-300 E12-300	EDP3 8&12 Multi-Channel E8 & E12 1200	EDP3 16 & 24 Multi-Channel 20UL	EDP3 16 & 24 Multi-Channel 100UL	Research Reference 2.5ul	Research Reference 10ul	Reference Ultra Micro 20ul gray	Research Reference 20ul Yellow	Research Reference 100ul	Research Reference 200ul	Reference 250ul	Research Reference 1000ul	Research Reference 5000ul	Research Multichannel 8 & 12 10ul	Research Multichannel 8 & 12 100ul	Research Multichannel 8 & 12 300ul	Response 4850 Electric 10ul
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1ML to 5 ML																											
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ART CROSS REFERENCE

	EPPENDORF														LABSYSTEMS						
	Response 4850 Electric 100ul	Response 4850 Electric 500ul	Response 4850 Electric 1000ul	Titerman 4908 Multi-Channel 10ul	Titerman 4908 Multi-Channel 50ul	Titerman 4908 Multi-Channel 300ul	Research Pro Electronic 10ul	Research Pro Electronic 100ul	Research Pro Electronic 300ul	Research Pro Electronic 1000ul	Research Pro Multi-Channel 8 & 12 10ul	Research Pro Multi-Channel 8 & 12 100ul	Research Pro Multi-Channel 8 & 12 300ul	Research Pro Multi-Channel 8 1200ul	FinnPipette Digital 2ul	FinnPipette Digital 10ul	FinnPipette Digital 10ul UNIVERSAL	FinnPipette Digital 20ul	FinnPipette Digital 50ul	FinnPipette Digital 100ul	FinnPipette Digital 200ul
10ul																					
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ART 100 ERGO-F																				•	
ART GEL 100																					
ART XLP																					
200ul to 500ul																					
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ART 1000E										•											
ART 1000 REACH																					
ART 1000G			•																		
ART1000L																					
ART 1000 ERGO-G																					
ART 1000 ERGO-F																					
ART 1200																					
ART 1250																					
ART 5000																					

					LABSYSTEMS																			
FinnPipette Digital 1000ul	FinnPipette Digital 5000ul	FinnPipette 8 &12 Digital Multi-Channel 10ul	FinnPipette 8 &12 Digital Multi-Channel 50ul	FinnPipette 8 &12 Digital Multi-Channel 300ul	FinnPipette Focus 3ul	FinnPipette Focus 5ul	FinnPipette Focus 10ul	FinnPipette Focus 10ul UNIVERSAL	FinnPipette Focus 30ul	FinnPipette Focus 30ul UNIVERSAL	FinnPipette Focus 50ul	FinnPipette Focus 50ul UNIVERSAL	FinnPipette Focus 100ul	FinnPipette Focus 300ul	FinnPipette Focus 1000ul	FinnPipette 8 &12 Focus Multi-Channel 10ul	FinnPipette 8 &12 Focus Multi-Channel 50ul	FinnPipette 8 &12 Focus Multi-Channel 300ul	FinnPipette BioControl Single Channel 40ul	FinnPipette BioControl Single Channel 200ul	FinnPipette BioControl Single Channel 1000ul	FinnPipette BioControl Multi Channel 8 & 12 10ul	FinnPipette BioControl Multi Channel 8 & 12 50ul	FinnPipette BioControl Multi Channel 8 & 12 300ul
10ul																								
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ART CROSS REFERENCE

	NICHIRYO/OXFORD								BIOHIT													
	BenchMate 2ul	BenchMate 10ul	BenchMate 20ul	BenchMate 50ul	BenchMate 100ul	BenchMate 200ul	BenchMate 1000ul	BenchMate 5000ul	Proline Electronic 10ul	Proline Electronic 100ul	Proline Electronic 250ul	Proline Electronic 500ul	Proline Electronic 1000ul	Proline Variable 10ul	Proline Variable 50ul	Proline Variable 200ul	Proline Variable 1000ul	Proline Variable 5000ul	Prolin Multi-Channel 10ul	Proline Multi-Channel 50ul	Proline Multi-Channel 100ul	Proline Multi-Channel 250ul
10ul																						
ART 10	•	•												•					•			
ART 10 REACH	•	•							•										•			
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ART 20 ERGO-F																						
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ART 100E					•	•				•	•				•							•
ART 100 ERGO-G																						
ART 100 ERGO-F																						
ART GEL 100																						
ART XLP																						
200ul to 500ul																						
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ART 200U																						
ART 200G																						
ART200L																						
ART 200 ERGO-G																						
ART 200 ERGO-F																						
ART XLP 200																						
ART XLG						•					•											
ART 300						•					•				•							•
1ML to 5 ML																						
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ART 1000 REACH							•						•									
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ART1000L																						
ART 1000 ERGO-G																						
ART 1000 ERGO-F																						
ART 1200																						
ART 1250																						
ART 5000																						

SOCOREX										MLA				BRANDTECH												
Calibra 2ul	Calibra 10ul	Calibra 20ul	Calibra 100ul	Calibra 200ul	Calibra 1000ul	Calibra Multichannel 50ul	Calibra Multichannel 100ul	Calibra Multichannel 200ul	MLA 50ul	MLA 200ul	MLA 5000ul	Digital Pipet 200ul	Transferpette Multi-Channel 10ul	Transferpette Multi-Channel 20ul	Transferpette Multi-Channel 25ul	Transferpette Multi-Channel 50ul	Transferpette Multi-Channel 100ul	Transferpette Multi-Channel 200ul	Transferpette Multi-Channel 300ul	Transferpette 10ul	Transferpette 20ul Ultra Micro	Transferpette 20ul	Transferpette 50ul	Transferpette 100ul	Transferpette 200ul
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20ul to 100ul																									
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200ul to 500ul																									
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																		•							•
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1ML to 5 ML																									
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					•																				
					•																				
											•														

ART CROSS REFERENCE

				CORNING						HAMILTON						CAPP				MATRIX			
	Transferpette 250ul	Transferpette 1000ul	Transferpette 5000ul	4959 2ul	4961 20ul	4963 200ul	4960 10ul	4962 100ul	4964 1000ul	Precision 2ul	Precision 10ul	Precision 25ul	Precision 100ul	Precision 300ul	Precision 1000ul	Capp Aero 10ul	Capp Aero 50ul	Capp Aero 200ul	Capp Aero 1000ul	Matrix Impact 1250ul	Matrix Impact 2 1250ul	Matrix Electronic 125ul	Matrix Electronic 250ul
10ul																							
ART 10							•			•	•					•							
ART 10 REACH				•			•			•	•					•							
ART 10F													•	•			•	•					
ART 20E										•	•												
20ul to 100ul																							
ART 20										•	•												
ART 20P					•							•						•					
ART GEL 20P																							
ART 20L																							
ART 20 ERGO-F																							
ART 50U																							
ART 100													•	•			•	•					
ART 100E								•				•						•					
ART 100 ERGO-G																							
ART 100 ERGO-F																							
ART GEL 100																							
ART XLP												•	•				•	•				•	•
200ul to 500ul																							
ART 200						•							•	•			•	•					
ART 200U																							
ART 200G																							
ART200L																							
ART 200 ERGO-G																							
ART 200 ERGO-F																							
ART XLP 200												•	•				•	•				•	•
ART XLG												•	•				•	•				•	•
ART 300														•								•	•
1ML to 5 ML																							
ART 1000		•							•						•								
ART 1000E		•							•						•								
ART 1000 REACH		•													•								
ART 1000G		•													•								
ART1000L																							
ART 1000 ERGO-G																							
ART 1000 ERGO-F																							
ART 1200																							
ART 1250																							
ART 5000																							

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Appendix J: Hydrologix Cross-Reference Pipettor Tip Fits Chart

For catalog part number reference use the first three digits to find the correct tip series. i.e. For catalog 3502-05 the first three digits are 350 for the 3500 series. Last digit changes, depending on packaging configurations.		Gilson/Pipetman								RAININ									
		Pipetman P-2 2ul	Pipetman P-10 10ul	Pipetman P-20 w 20ul	Pipetman P-100 100ul	Pipetman P-200 200ul	Pipetman P-1000 1000ul	Pipetman P-5000 5ML	Pipetman P-10ML 10ML	EP-10/E2-MIC-10 10ul	EP-25/E2-25 25ul	EP-100/E2-100 100ul	EP-250/E2-100 250ul	EP-1000/E2-1000 1000ul	Pipet Lite LTS L-2 2ul	Pipet Lite LTS L-10 10ul	Pipet Lite LTS L-20 20ul	Pipet Lite LTS L-100 100ul	Pipet Lite LTS L-200 200ul
10ul																			
HLT 10 Micro	3500	•	•							•									
HLT 10 Reach	3510	•	•							•									
HLT 10 Ultra Micro	3520																		
HLT 10 Ultra Micro Gel	3652																		
HLT 10 Round Gel	3653										•								
HLT 10 Round Gel .57mm	3651	•	•																
HLT 10 Micro Flat Gel	3641	•	•																
HLT 10 Flat Gel	3661	•	•																
HLT 10 Ultra Flat Gel	3671	•	•																
HLT 20 SoftFit~L	3721																•		
200ul																			
HLT 200 Standard Yellow	3900			•	•	•													
HLT 200 Standard Clear	3910			•	•	•													
HLT 200 Yellow Beveled	3920			•	•	•													
HLT 200 Graduated Clear	3930			•	•	•													
HLT 200 Yellow Eppendorf	3940			•	•	•													
HLT 250 Thin wall Yellow	3960			•	•	•													
HLT 250 Thin wall Clear	3550			•	•	•													
HLT XLP X-tra long	3540				•	•													
HLT 200 SoftFit~L	3751																	•	•
HLT 200 Ergo-F	3811																		
HLT 200 Ergo-G	3831					•													
HLT 200 Titertek	3850			•	•	•													
HLT 200 Round Gel	3621			•	•	•													
HLT 200 Flat Gel	3631			•	•	•													
HLT 200 Round Gel	3690			•	•	•													
HLT 200G wide bore	3530			•	•	•													
HLT XLG X-long wide bore	3700				•	•							•						
HLT 300 Titertek Grad	3570					•													
HLT 300U Multi-channel	3771					•							•						
HLT 300 Titertek	3860				•	•													
1000ul																			
HLT 1000 Standard Blue	3950						•												
HLT 1000 Standard Clear	3970						•												
HLT 1000 Graduated	3980						•												
HLT Blue Eppendorf	3990																		
HLT 1000 Reach	3791						•							•					
HLT 1000 SoftFit	3581						•							•					
HLT 1000 SoftFit~L	3781																		
HLT 1000G wide bore	3590																		
HLT 1000 Ergo-F	3821																		
HLT 1000 Ergo-G	3841						•												
HLT 1200 Biohit	3800																		
HLT 1250 Matrix	3680																		
HLT 1300 Matrix	3890																		
HLT 1500 Titertek	3891																		
5ML and 10ML																			
HLT 5000 Blunt end	3895							•											
HLT 5000 MicroPoint	3896																		
HLT 5000 Reach	3897																		
HLT 10ML	3898								•										

For HLT catalog part number reference use the first three digits to find the correct tip series. i.e. For catalog 3502-05 the first three digits are 350 for the 3500 series. Last digit changes, depending on packaging configurations.

		RAININ																	
		Pipet Lite LTS L-1000 1000ul	LTS 8 & 12 Multi-Channel L8-10 L12-10	LTS 8 & 12 Multi-Channel L8-20 L12-20	LTS 8 & 12 Multi-Channel L8-200 L12-200	LTS 8 & 12 Multi-Channel L8-300 L12-300	LTS 8 & 12 Multi-Channel L8 & L12-1200	EDP3 Electronic E3-10	EDP3 Electronic E3-20	EDP3 Electronic E3-100	EDP3 Electronic E3-200	EDP3 Electronic E3-1000	EDP3 8&12 Multi-Channel E8-10 E12-10	EDP3 8&12 Multi-Channel E8-20 E12-20	EDP3 8&12 Multi-Channel E8-200 E12-200	EDP3 8&12 Multi-Channel E8-300 E12-300	EDP3 8&12 Multi-Channel E8 & E12 1200	EDP3 16 & 24 Multi-Channel 20UL	EDP3 16 & 24 Multi-Channel 100UL
10ul																			
HLT 10 Micro	3500																		
HLT 10 Reach	3510																		
HLT 10 Ultra Micro	3520																		
HLT 10 Ultra Micro Gel	3652																		
HLT 10 Round Gel	3653																		
HLT 10 Round Gel .57mm	3651																		
HLT 10 Micro Flat Gel	3641																		
HLT 10 Flat Gel	3661																		
HLT 10 Ultra Flat Gel	3671																		
HLT 20 SoftFit~L	3721			•					•					•				•	
200ul																			
HLT 200 Standard Yellow	3900																		
HLT 200 Standard Clear	3910																		
HLT 200 Yellow Beveled	3920																		
HLT 200 Graduated Clear	3930																		
HLT 200 Yellow Eppendorf	3940																		
HLT 250 Thin wall Yellow	3960																		
HLT 250 Thin wall Clear	3550																		
HLT XLP X-tra long	3540																		
HLT 200 SoftFit~L	3751				•					•	•				•				•
HLT 200 Ergo-F	3811																		
HLT 200 Ergo-G	3831																		
HLT 200 Titertek	3850																		
HLT 200 Round Gel	3621																		
HLT 200 Flat Gel	3631																		
HLT 200 Round Gel	3690																		
HLT 200G wide bore	3530																		
HLT XLG X-long wide bore	3700																		
HLT 300 Titertek Grad	3570																		
HLT 300U Multi-channel	3771																		
HLT 300 Titertek	3860																		
1000ul																			
HLT 1000 Standard Blue	3950																		
HLT 1000 Standard Clear	3970																		
HLT 1000 Graduated	3980																		
HLT Blue Eppendorf	3990																		
HLT 1000 Reach	3791																		
HLT 1000 SoftFit	3581																		
HLT 1000 SoftFit~L	3781	•																	
HLT 1000G wide bore	3590																		
HLT 1000 Ergo-F	3821																		
HLT 1000 Ergo-G	3841																		
HLT 1200 Biohit	3800																		
HLT 1250 Matrix	3680																		
HLT 1300 Matrix	3890																		
HLT 1500 Titertek	3891																		
5ML and 10ML																			
HLT 5000 Blunt end	3895																		
HLT 5000 MicroPoint	3896																		
HLT 5000 Reach	3897																		
HLT 10ML	3898																		

EPPENDORF						EPPENDORF																	
Research Reference 2.5ul	Research Reference 10ul	Reference Ultra Micro 20ul gray	Research Reference 20ul Yellow	Research Reference 100ul	Research Reference 200ul	Reference 250ul	Research Reference 1000ul	Research Reference 5000ul	Research Multichannel 8 & 12 10ul	Research Multichannel 8 & 12 100ul	Research Multichannel 8 & 12 300ul	Response 4850 Electric 10ul	Response 4850 Electric 100ul	Response 4850 Electric 500ul	Response 4850 Electric 1000ul	Titerman 4908 Multi-Channel 10ul	Titerman 4908 Multi-Channel 50ul	Titerman 4908 Multi-Channel 300ul	Research Pro Electronic 10ul	Research Pro Electronic 100ul	Research Pro Electronic 300ul	Research Pro Electronic 1000ul
10ul																							
•																							
	•	•							•			•				•			•			
	•	•																					
	•	•																					
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200ul																							
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			•	•	•					•													
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			•	•	•					•													
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1000ul																							
							•																
							•																
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							•									•							
							•									•							
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5ML and 10ML																							
								•															

For catalog part number reference use the first three digits to find the correct tip series. i.e. For catalog 3502-05 the first three digits are 350 for the 3500 series. Last digit changes, depending on packaging configurations.							LABSYSTEMS			LABSYSTEMS											
		Research Pro Multi-Channel 8 & 12 10ul	Research Pro Multi-Channel 8 & 12 100ul	Research Pro Multi-Channel 8 & 12 300ul	Research Pro Multi-Channel 8 1200ul		FinnPipette Digital 2ul	FinnPipette Digital 10ul	FinnPipette Digital 10ul UNIVERSAL	FinnPipette Digital 20ul	FinnPipette Digital 50ul	FinnPipette Digital 100ul	FinnPipette Digital 200ul	FinnPipette Digital 1000ul	FinnPipette Digital 5000ul	FinnPipette 8 &12 Digital Multi-Channel 10ul	FinnPipette 8 &12 Digital Multi-Channel 50ul	FinnPipette 8 &12 Digital Multi-Channel 300ul	FinnPipette Focus 3ul	FinnPipette Focus 5ul
10ul																					
HLT 10 Micro	3500						•	•								•			•	•	
HLT 10 Reach	3510						•	•								•			•	•	
HLT 10 Ultra Micro	3520	•																			
HLT 10 Ultra Micro Gel	3652							•													
HLT 10 Round Gel	3653																				
HLT 10 Round Gel .57mm	3651						•	•											•		
HLT 10 Micro Flat Gel	3641						•	•													
HLT 10 Flat Gel	3661						•	•											•		
HLT 10 Ultra Flat Gel	3671						•	•											•		
HLT 20 SoftFit~L	3721																				
200ul																					
HLT 200 Standard Yellow	3900										•	•	•								
HLT 200 Standard Clear	3910										•	•	•								
HLT 200 Yellow Beveled	3920										•	•	•								
HLT 200 Graduated Clear	3930										•	•	•								
HLT 200 Yellow Eppendorf	3940							•			•		•								
HLT 250 Thin wall Yellow	3960										•	•	•								
HLT 250 Thin wall Clear	3550										•	•	•								
HLT XLP X-tra long	3540											•	•								
HLT 200 SoftFit~L	3751																				
HLT 200 Ergo-F	3811																				
HLT 200 Ergo-G	3831																				
HLT 200 Titertek	3850									•	•		•					•			
HLT 200 Round Gel	3621								•	•	•	•	•				•				
HLT 200 Flat Gel	3631								•	•	•	•	•				•				
HLT 200 Round Gel	3690								•	•	•	•	•								
HLT 200G wide bore	3530								•	•	•	•	•				•	•			
HLT XLG X-long wide bore	3700																				
HLT 300 Titertek Grad	3570									•	•		•								
HLT 300U Multi-channel	3771												•					•			
HLT 300 Titertek	3860									•	•		•								
1000ul																					
HLT 1000 Standard Blue	3950													•							
HLT 1000 Graduated	3980													•							
HLT Blue Eppendorf	3990													•							
HLT 1000 Reach	3791													•							
HLT 1000 SoftFit	3581													•							
HLT 1000 SoftFit~L	3781																				
HLT 1000G wide bore	3590																				
HLT 1000 Ergo-F	3821													•							
HLT 1000 Ergo-G	3841																				
HLT 1200 Biohit	3800																				
HLT 1250 Matrix	3680																				
HLT 1300 Matrix	3890																				
HLT 1500 Titertek	3891																				
5ML and 10ML																					
HLT 5000 Blunt end	3895																				
HLT 5000 MicroPoint	3896														•						
HLT 5000 Reach	3897																				
HLT 10ML	3898																				

														LABSYSTEMS					NICHIRYO/OXFORD					
FinnPipette Focus 10ul	FinnPipette Focus 10ul UNIVERSAL	FinnPipette Focus 30ul	FinnPipette Focus 30ul UNIVERSAL	FinnPipette Focus 50ul	FinnPipette Focus 50ul UNIVERSAL	FinnPipette Focus 100ul	FinnPipette Focus 300ul	FinnPipette Focus 1000ul	FinnPipette 8 &12 Focus Multi-Channel 10ul	FinnPipette 8 &12 Focus Multi-Channel 50ul	FinnPipette 8 &12 Focus Multi-Channel 300ul	FinnPipette BioControl Single Channel 40ul	FinnPipette BioControl Single Channel 200ul	FinnPipette BioControl Single Channel 1000ul	FinnPipette BioControl Multi Channel 8 & 12 10ul	FinnPipette BioControl Multi Channel 8 &12 50ul	FinnPipette BioControl Multi Channel 8 & 12 300ul	BenchMate 2ul	BenchMate 10ul	BenchMate 20ul	BenchMate 50ul	BenchMate 100ul	BenchMate 200ul
10ul																								
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•									•						•			•	•					•
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•																			•					
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200ul																								
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1000ul																								
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5ML and 10ML																								

For catalog part number reference use the first three digits to find the correct tip series. i.e. For catalog 3502-05 the first three digits are 350 for the 3500 series. Last digit changes, depending on packaging configurations.				BIOHIT											BIOHIT		
		BenchMate 1000ul	BenchMate 5000ul	Proline Electronic 10ul	Proline Electronic 100ul	Proline Electronic 250ul	Proline Electronic 500ul	Proline Electronic 1000ul	Proline Variable 10ul	Proline Variable 50ul	Proline Variable 200ul	Proline Variable 1000ul	Proline Variable 5000ul	Proline Multi-Channel 10ul	Proline Multi-Channel 50ul	Proline Multi-Channel 100ul	Proline Multi-Channel 250ul
10ul																	
HLT 10 Micro	3500			•					•					•			
HLT 10 Reach	3510			•					•					•			
HLT 10 Ultra Micro	3520																
HLT 10 Ultra Micro Gel	3652																
HLT 10 Round Gel	3653																
HLT 10 Round Gel .57mm	3651			•					•					•			
HLT 10 Micro Flat Gel	3641								•								
HLT 10 Flat Gel	3661			•					•					•			
HLT 10 Ultra Flat Gel	3671			•					•					•			
HLT 20 SoftFit~L	3721																
200ul																	
HLT 200 Standard Yellow	3900				•				•	•	•					•	
HLT 200 Standard Clear	3910				•				•	•	•					•	
HLT 200 Yellow Beveled	3920				•				•	•	•					•	
HLT 200 Graduated Clear	3930				•				•	•	•					•	
HLT 200 Yellow Eppendorf	3940				•				•	•	•					•	•
HLT 250 Thin wall Yellow	3960				•				•	•	•					•	
HLT 250 Thin wall Clear	3550				•				•	•	•					•	
HLT XLP X-tra long	3540				•					•	•						
HLT 200 SoftFit~L	3751																
HLT 200 Ergo-F	3811																
HLT 200 Ergo-G	3831																
HLT 200 Titertek	3850				•	•			•	•	•						•
HLT 200 Round Gel	3621									•	•						
HLT 200 Flat Gel	3631									•	•						
HLT 200 Round Gel	3690				•				•	•	•						
HLT 200G wide bore	3530				•				•	•	•						
HLT XLG X-long wide bore	3700																
HLT 300 Titertek Grad	3570					•			•	•	•						•
HLT 300U Multi-channel	3771										•						
HLT 300 Titertek	3860				•	•			•	•	•						•
1000ul																	
HLT 1000 Standard Blue	3950	•					•					•					
HLT 1000 Graduated	3980	•					•					•					
HLT Blue Eppendorf	3990	•					•	•				•					
HLT 1000 Reach	3791	•					•	•				•					
HLT 1000 SoftFit	3581	•					•	•				•					
HLT 1000 SoftFit~L	3781																
HLT 1000G wide bore	3590																
HLT 1000 Ergo-F	3821																
HLT 1000 Ergo-G	3841																
HLT 1200 Biohit	3800																
HLT 1250 Matrix	3680																
HLT 1300 Matrix	3890																
HLT 1500 Titertek	3891																
5ML and 10ML																	
HLT 5000 Blunt end	3895		•														
HLT 5000 MicroPoint	3896																
HLT 5000 Reach	3897												•				
HLT 10ML	3898																

SOCOREX									MLA				BRANDTECH							BRANDTECH		
Calibra 2ul	Calibra 10ul	Calibra 20ul	Calibra 100ul	Calibra 200ul	Calibra 1000ul	Calibra Multichannel 50ul	Calibra Multichannel 100ul	Calibra Multichannel 200ul	MLA 50ul	MLA 200ul	MLA 5000ul	Digital Pipet 200ul	Transferpette Multi-Channel 10ul	Transferpette Multi-Channel 20ul	Transferpette Multi-Channel 25ul	Transferpette Multi-Channel 50ul	Transferpette Multi-Channel 100ul	Transferpette Multi-Channel 200ul	Transferpette Multi-Channel 300ul	Transferpette 10ul	Transferpette 20ul Ultra Micro	Transferpette 20ul
10ul																						
•	•												•	•						•	•	
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•	•												•	•						•	•	
•	•																			•	•	
•	•																			•	•	
200ul																						
		•	•	•			•	•	•	•					•	•	•	•				•
		•	•	•			•	•	•	•					•	•	•	•				•
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		•	•	•			•															
1000ul																						
					•																	
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5ML and 10ML																						
											•											

For catalog part number reference use the first three digits to find the correct tip series. i.e. For catalog 3502-05 the first three digits are 350 for the 3500 series. Last digit changes, depending on packaging configurations.								CORNING						HAMILTON					
		Transferpette 50ul	Transferpette 100ul	Transferpette 200ul	Transferpette 250ul	Transferpette 1000ul	Transferpette 5000ul	4959 2ul	4961 20ul	4963 200ul	4960 10ul	4962 100ul	4964 1000ul	Precision 2ul	Precision 10ul	Precision 25ul	Precision 100ul	Precision 300ul	Precision 1000ul
10ul																			
HLT 10 Micro	3500							•			•				•				
HLT 10 Reach	3510													•	•		•	•	
HLT 10 Ultra Micro	3520													•	•				
HLT 10 Ultra Micro Gel	3652													•	•				
HLT 10 Round Gel	3653								•					•	•				
HLT 10 Round Gel .57mm	3651																		
HLT 10 Micro Flat Gel	3641																		
HLT 10 Flat Gel	3661																		
HLT 10 Ultra Flat Gel	3671																		
HLT 20 SoftFit~L	3721																		
200ul																			
HLT 200 Standard Yellow	3900	•	•	•												•	•	•	
HLT 200 Standard Clear	3910	•	•	•												•	•	•	
HLT 200 Yellow Beveled	3920	•	•	•												•	•	•	
HLT 200 Graduated Clear	3930	•	•	•												•	•	•	
HLT 200 Yellow Eppendorf	3940	•	•	•												•	•	•	
HLT 250 Thin wall Yellow	3960	•	•	•												•	•	•	
HLT 250 Thin wall Clear	3550	•	•	•												•	•	•	
HLT XLP X-tra long	3540	•	•	•												•	•	•	
HLT 200 SoftFit~L	3751			•															
HLT 200 Ergo-F	3811																		
HLT 200 Ergo-G	3831																		
HLT 200 Titertek	3850			•												•	•	•	
HLT 200 Round Gel	3621																		
HLT 200 Flat Gel	3631																		
HLT 200 Round Gel	3690	•	•	•												•	•	•	
HLT 200G wide bore	3530	•	•	•												•	•	•	
HLT XLG X-long wide bore	3700																		
HLT 300 Titertek Grad	3570			•												•	•	•	
HLT 300U Multi-channel	3771																		
HLT 300 Titertek	3860			•												•	•	•	
1000ul																			
HLT 1000 Standard Blue	3950				•	•													•
HLT 1000 Graduated	3980				•	•													•
HLT Blue Eppendorf	3990				•	•													•
HLT 1000 Reach	3791				•	•													•
HLT 1000 SoftFit	3581				•	•													•
HLT 1000 SoftFit~L	3781																		
HLT 1000G wide bore	3590					•													
HLT 1000 Ergo-F	3821																		
HLT 1000 Ergo-G	3841																		
HLT 1200 Biohit	3800																		
HLT 1250 Matrix	3680																		
HLT 1300 Matrix	3890																		
HLT 1500 Titertek	3891																		
5ML and 10ML																			
HLT 5000 Blunt end	3895																		
HLT 5000 MicroPoint	3896						•												
HLT 5000 Reach	3897																		
HLT 10ML	3898																		

CAPP				MATRIX			
Capp Aero10ul	Capp Aero 50ul	Capp Aero 200ul	Capp Aero 1000ul	Matrix Impact 1250ul	Matrix Impact 2 1250ul	Matrix Electronic 125ul	Matrix Electronic 250ul
10ul							
•							
	•	•					
200ul							
1000ul							
				•	•		
				•	•		
5ML and 10ML							

Appendix K: HLT Packaging Configurations

• Available Packaging Configurations	Bulk Packaging 1000 tips		96 Tip Rack - Lift-off				96 Tip Rack - Hinged				100 Tip Rack - Lift-off				100 Tip Rack - Hinged				200 Tip Rack			
	Standard	Low Retention	Sterile	Non-sterile	Low Retetion Sterile	Low Retention Non-Sterile	Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile	Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile	Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile	Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile
10ul																						
HLT 10 (3500)	•	•	•	•	•	•																
HLT 10 Reach (3510)	•	•	•	•	•	•																
HLT Ultra Micro (3520)	•	•	•	•	•	•																
HLT Ultra Micro Gel 10 (3652)																						
HLT Round Gel 10 (3653)																						
HLT Round Gel 10 (3651)																				•		
HLT Flat Gel 10 (3661)																				•		
HLT Ultra-Flat Gel 10 (3671)																				•		
HLT 20 SoftFit~L (3721)			•	•	•	•																
200ul																						
HLT 200 Yellow (3900)	•		•	•																		
HLT 200 (3910)	•		•	•																		
HLT 200 Yellow Beveled (3920)	•		•	•																		
HLT 200 Beveled (3930)	•	•	•	•	•	•																
HLT 200 Yellow Eppendorf (3940)	•	•	•	•	•	•																
HLT 250 Yellow (3960)	•		•	•																		
HLT 250 (3550)	•	•	•	•	•	•																
HLT XLP (3540)	•																					
HLT 200 SoftFit~L(3751)			•	•	•	•																
HLT 200 Ergo-F (3811)			•	•	•	•																
HLT 200 Ergo-G (3831)			•	•	•	•																
HLT Titertek 200 (3850)	•		•	•																		
HLT Round Gel 200 (3621)																				•		
HLT Flat Gel 200 (3631)																				•		
HLT Ultra-Flat Gel 200 (3641)																				•		
HLT Round Gel 200 (3690)	•																					
HLT 200G (3530)	•		•	•																		
HLT XLG (3700)	•		•	•																		
HLT Titertek 300 (3570)	•		•	•																		
HLT 300U (3771)			•	•																		
HLT Titertek 300 (3860)	•		•	•																		
1000ul																						
HLT 1000 Blue (3950)	•										•	•										
HLT 1000 Graduated (3980)	•										•	•										
HLT Blue Eppendorf (3990)	•										•	•										
HLT 1000 Reach (3791)			•	•																		
HLT 1000 (3581)	•										•	•										
HLT 1000 SoftFit~L (3781)			•	•	•	•																
HLT 1000G (3590)	•										•	•										
HLT 1250 (3680)	•		•	•																		
HLT 1200 (3800)	•																					
HLT 1000 Ergo-F (3821)			•	•	•	•																
HLT 1000 Ergo-G (3841)			•	•	•	•																
HLT Titertek 1500 (3891)	•		•																			
5ML and 10ML																						
HLT 5000 (3895)	•																					
HLT 5000 (3896)	•																					
HLT 5000 Reach (3897)	•																					
HLT 10ML (3898)	•																					

204 Tip RacK				Stack Rack System				True Tip Reload System				Reload Inserts				Quality Loading System				BreakThru	
Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile	Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile	Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile	Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile	Sterile	Non-sterile	Low Retention Sterile	Low Retention Non-sterile	Pre-sterilized	Non-sterile
10ul																					
					•				•	•	•		•	•	•						
•																					
•																					
								•	•				•							•	•
200ul																					
					•																
					•			•	•	•	•		•	•	•						
								•	•				•								
					•			•	•	•	•		•		•						
•	•																				
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								•	•				•								
•	•																				
1000ul																					
					•			•	•				•								
								•	•				•								
								•	•				•								
								•	•				•								
5ML and 10ML																					